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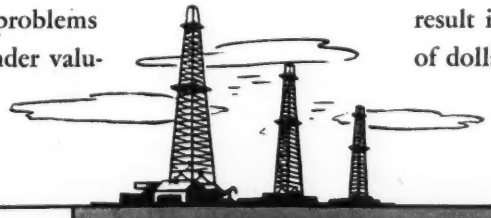

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August 15th, 1949
Telephone FAirfax 6218

Washington Highlights

Japanese are using American seismic equipment in searches for more petroleum. According to word received here, one set of seismic reflection equipment purchased with American funds is in use in northwest Honshu by Imperial Oil Company geophysicists. The seismic study is under direction of Horton Jenkins of Tulsa, Okla.

A "Taft-for-President" drive has been started in the House by Representative Mason, Republican of Illinois. He is of the belief that if Senator Taft is reelected in Ohio next year "nothing can stop him from becoming the Republican presidential candidate in 1952."

Census Bureau figures indicated the United States population has passed the 149,000,000 mark. The Bureau estimated the population, rising by nearly 200,000 a month in the first half of 1949, totaled 148,902,000 on June 1. No later compilations were given but the rate of increase denoted the population now is well above 149,000,000. Since the last census was taken on April 1, 1940, there has been a 12.1 per cent increase in the country's population.

The Senate has approved by voice vote and without debate the $702,930,769 cash appropriation recommended by its appropriation committee for the Atomic Energy Commission. Also voted was $387,189,628 in contract authority for the Atomic Commission.

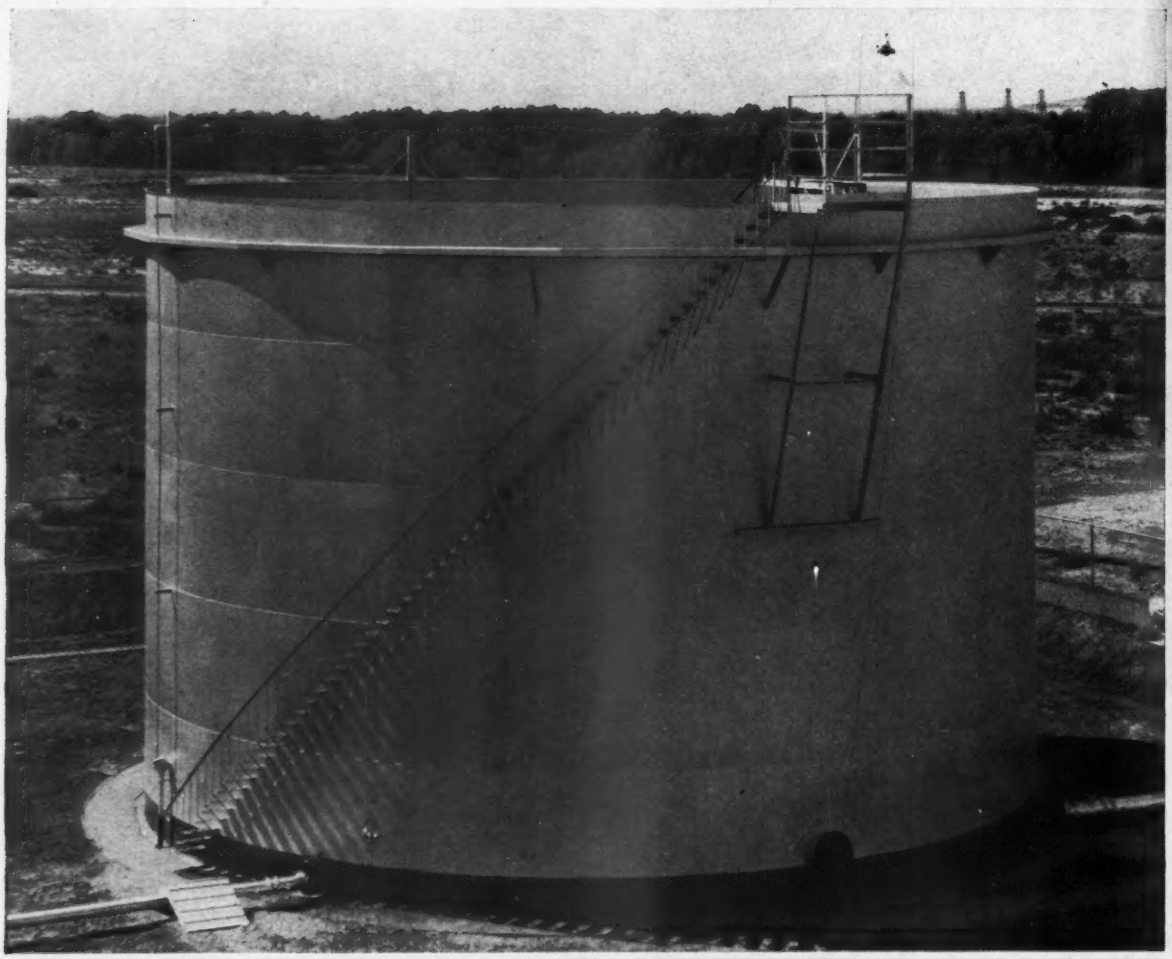
Under a stipulation signed by California Attorney General Howser state revenue from tideland oil will continue to be impounded until October of next year. The stipulation extends an agreement entered into by the State of California and Federal Government on July 26, 1947. The agreement was a sequel to the United States Supreme Court decision that California does not own the three-mile marginal submerged lands along its coast. Rentals and royalties from oil companies operating in the disputed tidal waters are being held pending a final decision by the high court on the line of demarcation between State and Federal territory. The fund at that time will be distributed concordant with the ruling of the court. Howser has filed briefs citing California is entitled to all waters between offshore islands and the mainland. A referee appointed by the court has made one report and before the final decision is made will file another one.

A. C. (Cy) Rubel, Union Oil Company of California, and E. E. (Ernie) Pyles, Jergins Oil Company at Long Beach, California, have been named to a committee to study how to provide substantial domestic oil reserves for emergencies. The committee was set up by Walter S. Hallanan, chairman of the National Petroleum Council at the request of Interior Secretary Krug. L. F. McCollum, Continental Oil Company, Ponca City, was named chairman of the new committee. Members of the group are representative of oil areas throughout the United States.

Attorney General Tom Clark has accepted appointment to the Supreme Court. Senator J. Howard McGrath at the same time has accepted the attorney generalship. McGrath indicated that he will resign his Senate seat and his post as Democratic National Committee Chairman when his appointment to the Cabinet is confirmed by the Senate. President Truman named Clark to the high court to fill the vacancy caused by the death of Justice Frank Murphy. William Boyle is expected to succeed McGrath as chairman of the Democratic National Committee.

Press advices from Rome denoted the Italian Government will participate financially in all oil companies. The decision was reported taken during a preliminary debate on a new Italian mine law by the interministerial committee for reconstruction. The law was submitted to the committee by Ivan Matteo Lombardo, Independent Socialist minister for industry and commerce.

The House Rules Committee, which clears legislation to the congressional floor, has been requested by Speaker Rayburn to act early on the Harris Bill, H.R. No. 1758, which was approved by the House Commerce Committee. The bill is designed to amend the Natural Gas Act in a manner to assure that the Federal Power Commission has no regulatory authority over production, gathering and field sales of natural gas by independent oil and gas operators.



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. . . reduces evaporation loss
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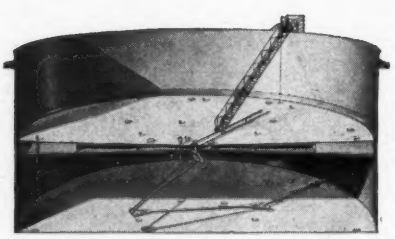
The Horton Double-Deck Floating Roof is designed to furnish the petroleum industry with an economical and dependable means of preventing excessive evaporation losses and to reduce the danger of fire when volatile liquids are stored in flat-bottom steel tanks. The Horton Floating Roof does both of these jobs simultaneously as it eliminates the vapor space where evaporation takes place, and where fire is most likely to occur. The roof floats directly upon the surface of the liquid in the tank.

The Horton Double-Deck Floating Roof is widely used at refineries, storage terminals, pipe line stations, and natural gasoline plants. It can be installed on new or existing flat-bottom tanks and is recommended for tanks that are filled and emptied more than six times a year. For complete information, write our nearest office for Bulletin B.



The top view shows a 20,000-bbl. tank with a Horton Double-Deck Floating Roof at the Richfield Oil Corporation's Coles Levee, California, plant. The cutaway view immediately above shows the construction features of a Horton Double-Deck Floating Roof.

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The Gas Turbine Particularly as Applied to the High Pressure Centrifugal Pipeline Booster

By R. M. Greene
Clark Bros. Co., Inc.

The use of the centrifugal compressor for pipeline booster duty in the transmission of natural gas at high pressures is well established. Ample evidence of this is provided by the more than one hundred units now operating on major transmission lines. As a consequence of this acceptance of the centrifugal compressor, increasing attention is being focused on the type of prime mover available to provide the relatively high rotative speeds required for its satisfactory application.

Three methods of drive may be considered for the centrifugal pipeline boosters:

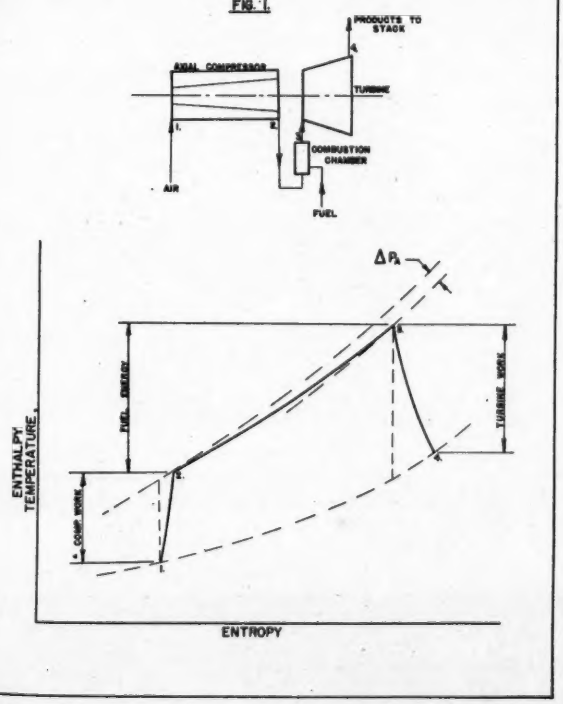
1. Electric motor, either directly connected or operating through a speed increasing gear.
2. Steam turbine.
3. Gas turbine.

To date, the electric motor has been used almost exclusively. For most applications, however, it possesses the fundamental disadvantage of having a high energy cost. When the motor is directly connected to the compressor, the rotative speed is relatively low, thus necessitating the use of two or more units arranged in series to develop the compression ratio obtainable with a single unit operating at optimum speed, and thereby resulting in increased first cost. With the interposition of a speed increasing gear between the motor and the compressor, this latter difficulty is eliminated, although the overall efficiency is reduced because of the mechanical losses inherent in the gear unit. In addition, if either a synchronous or squirrel cage induction motor is used, operating flexibility is sacrificed since variable speed control is impossible, without a variable speed coupling. The use of such a coupling is difficult to justify economically, and its availability is questionable in the sizes required.

In many instances, it is impossible to use the steam turbine as a prime mover because the water required for its operation is unavailable. To obtain the best possible efficiency, condensing operation is indicated, and it is to be noted that this greatly increases the amount of water required over that used in current pipeline practice. Forced-draft, air cooled units may be utilized, of course, to accomplish steam condensation, but it is then usually necessary to use a higher exhaust pressure than would be selected with a conventional shell and tube,

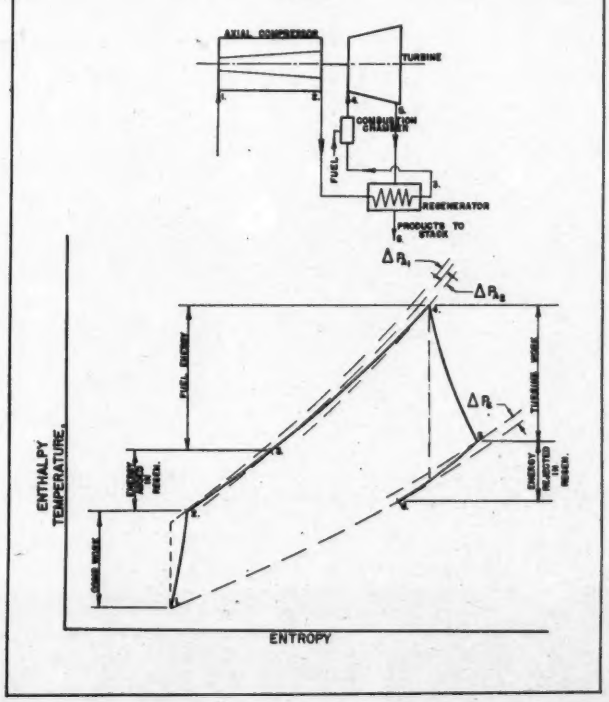
SIMPLE OPEN GAS TURBINE CYCLE

FIG. 1.



OPEN GAS TURBINE CYCLE WITH REGENERATION

FIG. 2.



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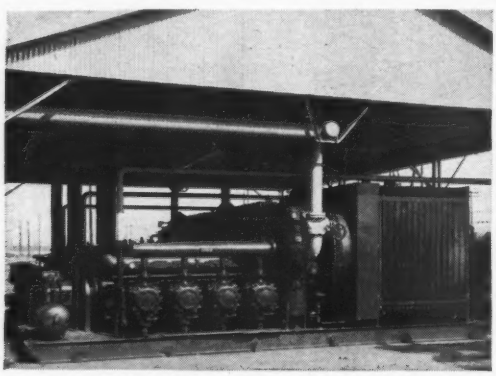
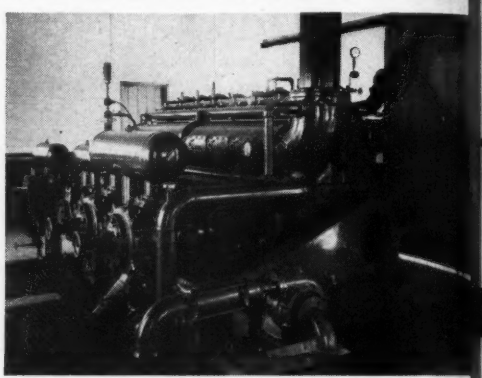
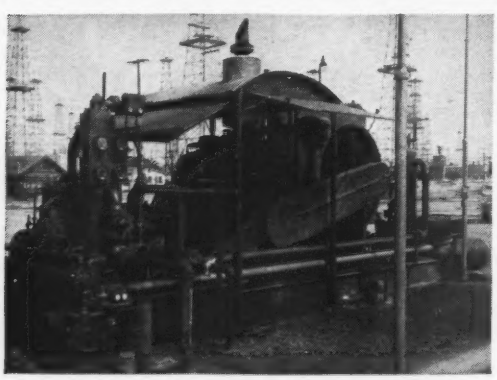


Three Clark Midget Angle 4-cylinder units, used for gas booster service at the Pacific Lighting Corporation, Wilmington, Cal.

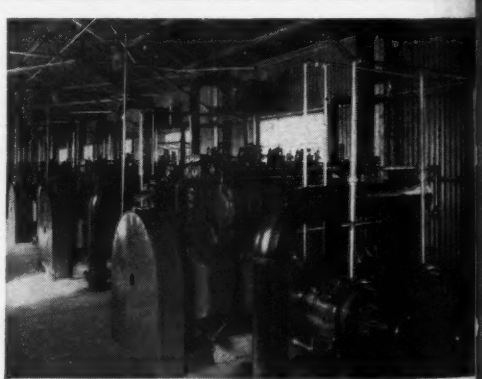


Clark Midget Angle 8-cylinder stationary units, used by the Union Oil Co., Lompoc, Cal., for gas booster service.

GATHERING FIELD GAS



Skid-mounted Midget Angle used for gathering field gas by Long Beach Oil Development, Long Beach, Cal.



Five stationary-mounted 4-cylinder Midget Angles at Consolidated Gas Utilities Company, Magic City, Texas.

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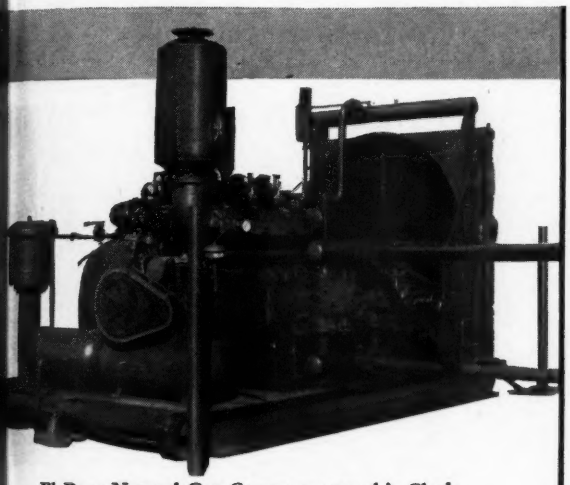

El Paso Natural Gas Company uses this Clark 4-cylinder semiportable MA unit for gas booster service at Jal, N. M.

These typical installations . . . only a few of hundreds throughout the industry . . . *prove* the versatility of Clark Gas-Engine-Driven "Midget Angle" Compressors.

For permanent installations, the "Midget Angle" cuts costs by occupying small floor space with light foundations. Mounted on skids, it is an ideal semiportable "packaged" compressor for short-duration jobs in the field.

Operating costs are low. Operation is practically automatic—one or two men can easily handle several stations.

Clark "Midget Angles" are available in 2, 4, 6 and 8 cylinder units, developing from 75 to 300 B.H.P. For further information call your nearest Clark Bros. office, or write for descriptive booklet.

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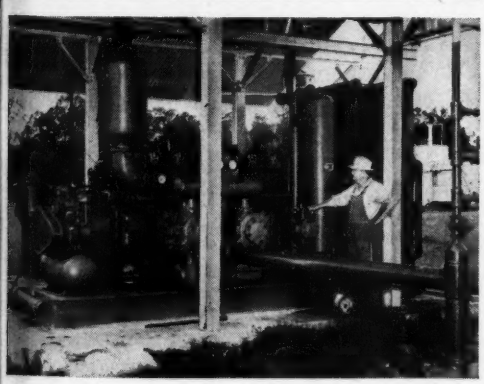
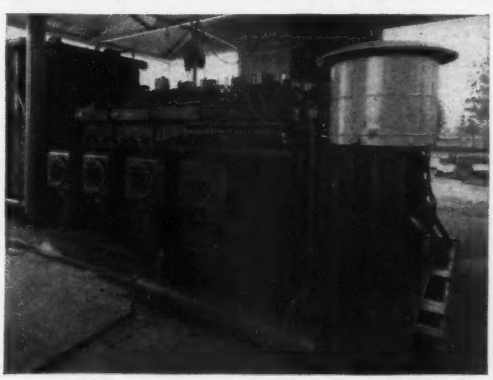
GAS LIFT



Skid-mounted Clark Midget Angle in gas lift service for the Atlantic Refining Co., Harden Field, Texas.

REPRESSURING



Two 8-cylinder Midget Angles used in repressuring residue gas back into producing sands—W. T. Burton Co., Stark, La.

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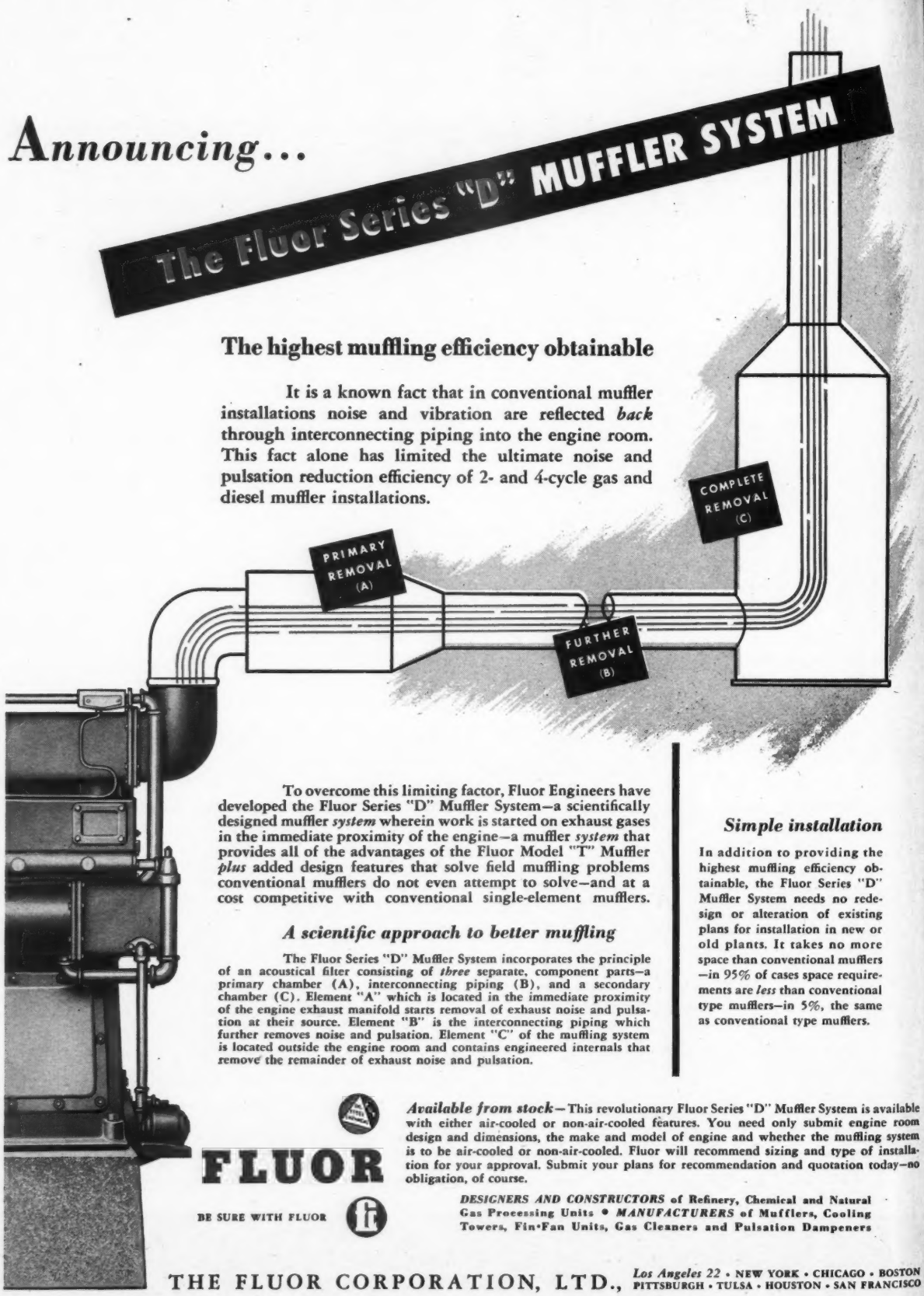
The Fluor Series "D" MUFFLER SYSTEM



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It is a known fact that in conventional muffler installations noise and vibration are reflected *back* through interconnecting piping into the engine room. This fact alone has limited the ultimate noise and pulsation reduction efficiency of 2- and 4-cycle gas and diesel muffler installations.

To overcome this limiting factor, Fluor Engineers have developed the Fluor Series "D" Muffler System—a scientifically designed muffler *system* wherein work is started on exhaust gases in the immediate proximity of the engine—a muffler *system* that provides all of the advantages of the Fluor Model "T" Muffler *plus* added design features that solve field muffling problems conventional mufflers do not even attempt to solve—and at a cost competitive with conventional single-element mufflers.

A scientific approach to better muffling

The Fluor Series "D" Muffler System incorporates the principle of an acoustical filter consisting of *three* separate, component parts—a primary chamber (A), interconnecting piping (B), and a secondary chamber (C). Element "A" which is located in the immediate proximity of the engine exhaust manifold starts removal of exhaust noise and pulsation at their source. Element "B" is the interconnecting piping which further removes noise and pulsation. Element "C" of the muffling system is located outside the engine room and contains engineered internals that remove the remainder of exhaust noise and pulsation.

Simple installation

In addition to providing the highest muffling efficiency obtainable, the Fluor Series "D" Muffler System needs no redesign or alteration of existing plans for installation in new or old plants. It takes no more space than conventional mufflers—in 95% of cases space requirements are *less* than conventional type mufflers—in 5%, the same as conventional type mufflers.

Available from stock—This revolutionary Fluor Series "D" Muffler System is available with either air-cooled or non-air-cooled features. You need only submit engine room design and dimensions, the make and model of engine and whether the muffling system is to be air-cooled or non-air-cooled. Fluor will recommend sizing and type of installation for your approval. Submit your plans for recommendation and quotation today—no obligation, of course.

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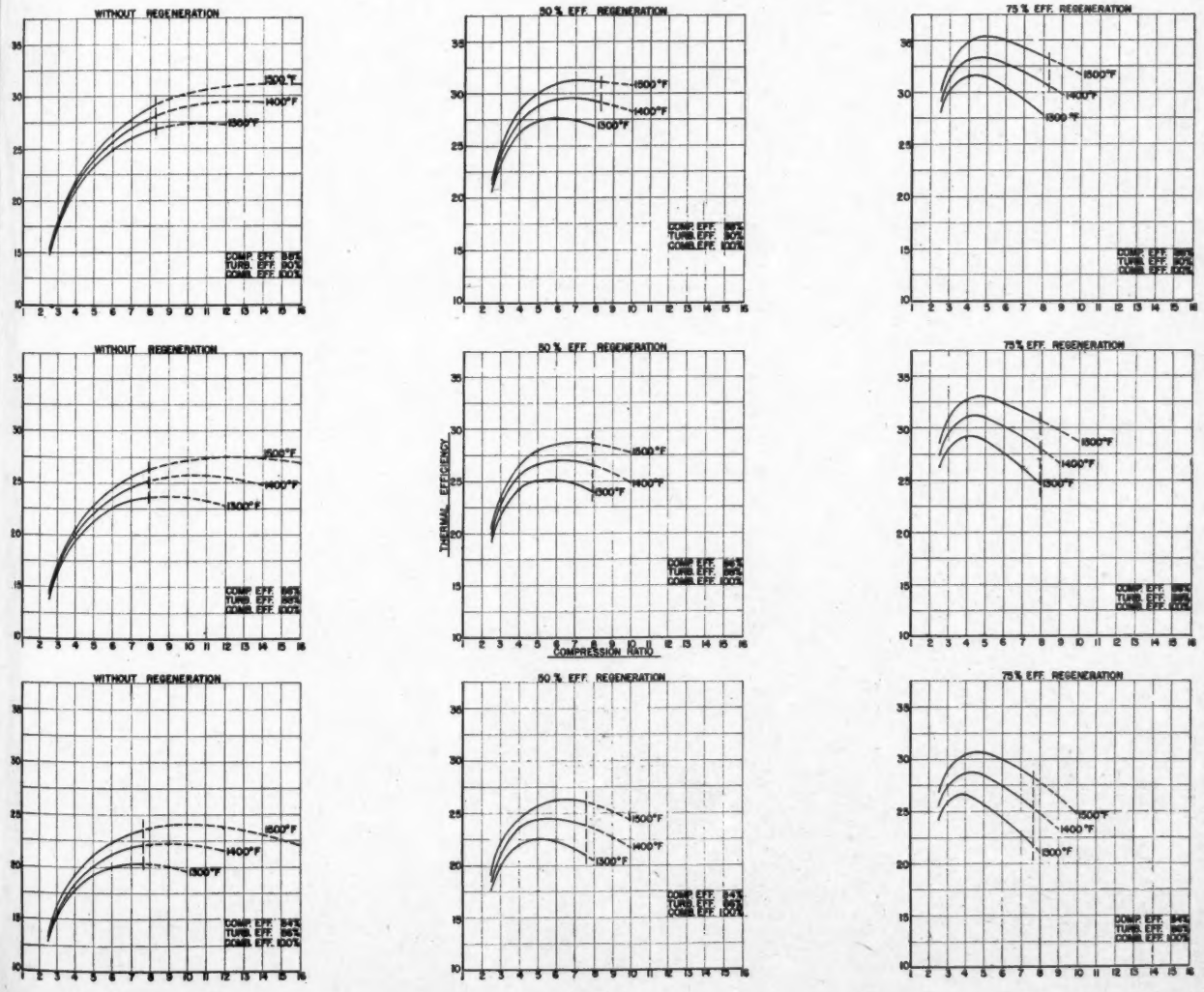
water cooled steam condenser to maintain a reasonable first cost. As a consequence, some compromise is necessarily made in thermal efficiency.

The gas turbine as a prime mover is not subject to any of the limitations previously mentioned for the electric motor and steam turbine. Among the many advantages which it offers, when utilized to drive a centrifugal pipe line booster are the following:

1. The amount of cooling water required for its operation is negligible, and can be completely eliminated by the use of forced-draft, air cooled units for the oil cooler circuits.
2. Variable speed control is obtainable, thus resulting in good operating flexibility.
3. The rotative speed matches that of the centrifugal compressor, thus making direct connection possible and eliminating the need for a speed increasing gear.
4. Present indications are that maintenance costs should be relatively low.
5. Because of its small size and weight per unit of capacity, and freedom from unbalanced forces, heavy foundations are not required and the investment in station construction is minimized.
6. Provision may be made to fire several fuels. Thus, in a cycle normally firing natural gas, fuel oil may be substituted during pipeline peak loads. In addition, the general economics of the fuels available may dictate the use of oil rather than gas at stations far from the source.
7. The investment in spare equipment may be minimized. To maintain the line capacity, with a unit down in any station, the operating temperature may be temporarily increased at stations upstream and downstream.
8. High thermal efficiency is obtainable if regeneration is utilized.

The concept of the gas turbine as a prime mover is not new. The Brayton Cycle, on which it operates, has long been known. The fundamental obstacle to its development has, however, been the inability to design and build components having a sufficiently high efficiency to produce a useful net power output when operating at the temperature

EFFECT OF TURBINE INLET TEMPERATURE AND REGENERATION ON THERMAL EFFICIENCY
FIG. 3



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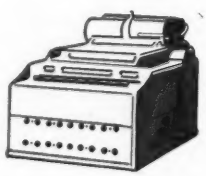

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established by then existing metallurgical limitations.

For pipeline applications, it is indicated that the open cycle, either with or without regeneration, will be utilized because of its inherent simplicity. The basic equipment arrangement, which does not utilize regeneration, is shown schematically in Fig. 1, and the cycle is represented on enthalpy-entropy coordinates. It is to be noted that this diagram is representative of the energy distribution between the various components of the cycle if it is assumed that (1) the mass rate of flow is constant (ie : the amount of fuel added is insignificant, and no air is used for cooling purposes), and (2) the analysis of the fluid acting on the turbine is the same as that being handled by the compressor. If perfect gas behavior is assumed, the enthalpy scale may of course be replaced by temperature.

By the installation of a heat exchanger or regenerator in the turbine exhaust to preheat the air to the combustion chamber, and thus decrease the sensible heat loss, the amount of fuel required for any given output can be decreased, thus increasing the cycle thermal efficiency. The equipment arrangement is shown schematically in Fig. 2, and the cycle is represented on enthalpy-entropy coordinates. It is apparent that the use of the regenerator does, however, impose additional pressure drop which reduces the effective turbine expansion ratio.

In the design, selection and application of the gas turbine, careful consideration must be given to the effect of each of the following primary factors:

1. Component Efficiency, including compressor, turbine, and combustion chamber.
2. Turbine inlet temperature.
3. Effectiveness of regenerator, if any.
4. Pressure drop.
5. Ambient air temperature.
6. Altitude.

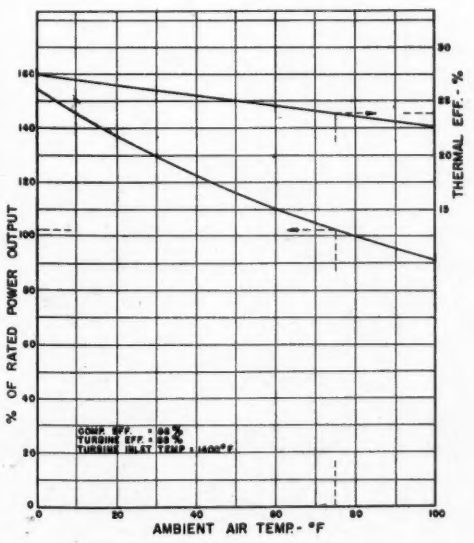
The general effect of compressor and turbine efficiency on the design of any unit is illustrated by the curves of Fig. 3, in which the thermal efficiency is plotted as a function of compression ratio and turbine inlet temperature for several efficiency combinations and 0%, 50%, and 75% regenerator effectiveness.

It is to be noted that, for any given turbine inlet temperature and regenerator effectiveness, there is a particular compression ratio corresponding to each efficiency combination which produces the maximum thermal efficiency. Since the efficiencies of the compressor and turbine have usually been established by previous tests of the manufacturer, the problem basically is to select the proper values of compression ratio, turbine inlet temperature, and regenerator effectiveness.

The compression ratio for maximum efficiency is not always obtainable. For units operating without regeneration, this compression ratio frequently results in a temperature rise across the axial flow air compressor which becomes prohibitive. The point at which this occurs is indicated on the curve of Fig. 3, by the dash lines, and is predicated upon a maximum per-

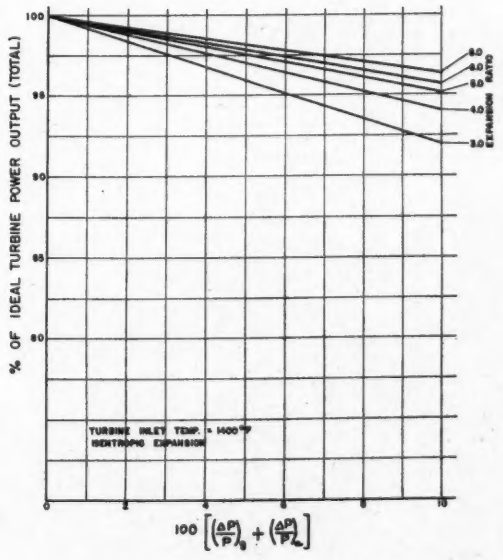
APPROXIMATE EFFECT OF AMBIENT AIR TEMPERATURE ON RATED POWER OUTPUT & THERMAL EFFICIENCY

FIG.4



EFFECT OF REGENERATOR PRESSURE DROP ON IDEAL TURBINE POWER OUTPUT (TOTAL)

FIG.5



missible temperature rise of 500°F. Intercooling, which changes the shape of these curves, may of course be utilized, but it has been presumed herein that for most pipeline applications this is undesirable because of cooling water limitations. It is noteworthy that if regeneration is used, the optimum compression ratio may be obtained without excessive temperature rise, and hence without the use of intercooling.

For a commercially acceptable, long-life unit, the selection of the turbine inlet temperature to be utilized is determined primarily by the following factors:

1. The design of the turbine.
2. The materials available.
3. The optimum balance between increased thermal efficiency, which is obtainable with higher turbine inlet temperatures and the resulting increased cost of maintenance and possible loss of revenue from interrupted service.
4. The variation between the power required at the normal operating condition and that at maximum overload, particularly as related to changing ambient air temperature.

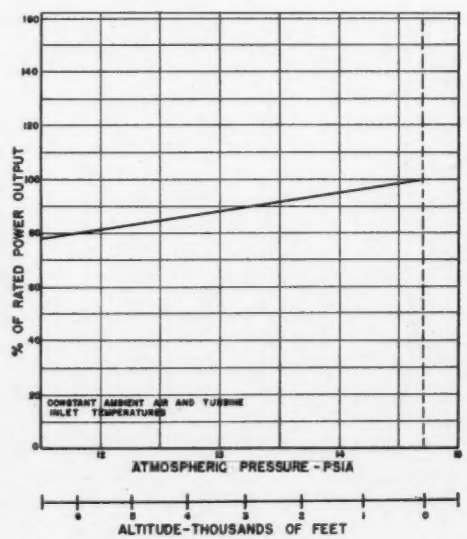
In evaluating the effect of turbine inlet temperature, it is to be recognized that in most cases it is not actually this temperature per se which is critical. It is true that the nozzles, nozzle partitions, and other stationary members are subjected to it, and the possibility of their oxidation must be considered. This is usually not a problem, however, if a satisfactory inlet temperature distribution is maintained. Of considerable more concern in the temperature which exists at the entrance to the first wheel, since at this point the tensile stresses imposed by centrifugal force also act. With little error, it may be assumed that an equal enthalpy (ie: temperature) drop is obtained per stage, with approximately sixty percent of this occurring through the stationary nozzles for reaction blading. It is therefore apparent that, for a given turbine inlet temperature, the temperature at the entrance to the first wheel will be determined by the number of stages in the design. Thus, an inlet temperatur which is entirely satisfactory for a two stage turbine may be prohibitive for one with six or eight stages. It is to be noted that frequently im pulse blading is used in the firs stage, with all of the temperature drop occurring through the station ary nozzles, to further reduce th temperature at the entrance to th first wheel.

Recent metallurgical progress ha made available materials suitabl for high temperature operation. A the present time, a number of unit for industrial applications have bee designed and built for temperature ranging from 1350°F to 1500°F. Un fortunately, none of these have bee operating for a sufficiently long pe riod to establish the maintenanc cost which may be anticipated.

Because of the effect of home an industrial heating loads, the deman on a pipeline may usually be ex pected to vary with seasonal change in temperature. The maximum de mand therefore usually exists dur ing winter months, when the am bient temperature is low, with a re duction in summer months when i is high. This particular conditio is very favorable to pipeline opera tion, as indicated by the curves Fig. 4. Here the variations in ne turbine power output and therma efficiency are plotted as a functio of the ambient air temperature fo a specific turbine, when operatin with a constant turbine inlet tem perature. It is to be noted that a the ambient air temperature de creases, which usually means a

APPROXIMATE EFFECT OF ALTITUDE ON RATED POWER OUTPUT

FIG 6.


% OF RATED POWER OUTPUT
CONSTANT AMBIENT AIR AND TURBINE INLET TEMPERATURES
ATMOSPHERIC PRESSURE - PSIA
ALTITUDE - THOUSANDS OF FEET

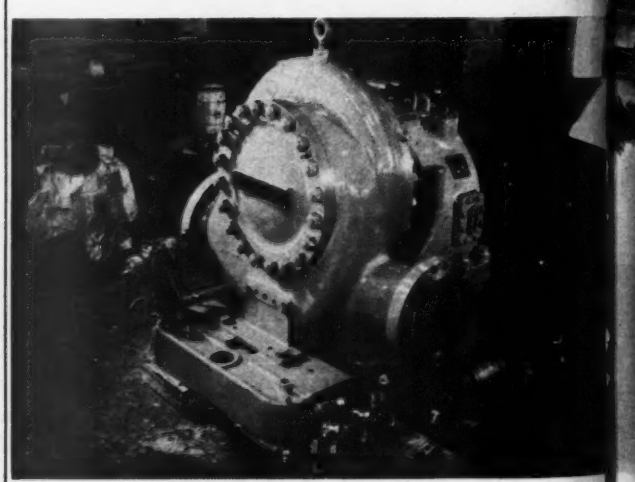
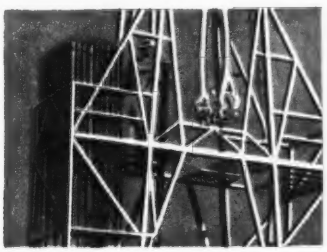


Figure 8

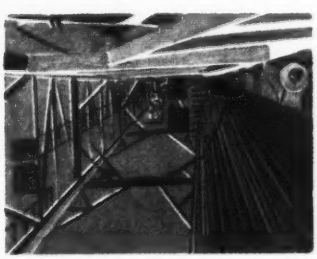
Sturdy Travelers...

EMSCO BULGE TYPE PORTABLE MASTS

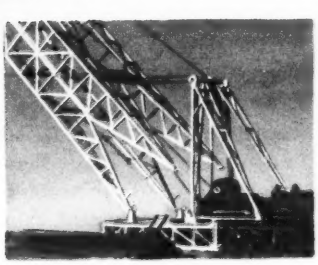
Easy to erect . . . safe to operate . . . quick to move! These are the operating characteristics of Emsco Bulge Type Portable Masts. For here are completely portable units designed and engineered for drilling to 15,000 feet. They may be quickly dismantled, moved to another location, and rigged up with a minimum of time and expense. Ask your nearest representative for complete information.



Exclusive *bulge* feature permits racking pipe inside base of mast. Casing may be run with drill pipe in bulge. Split board working platform speeds drilling operations.



Lacing of all four faces of mast eliminates need for interior bracing; gives unobstructed visibility to both driller and derrick man; minimizes vibration and weaving.



Mast easily and safely erected by drawworks. Patented safety features insure positive control. Mast is readily dismantled into road width packages, or moved intact.

A SIZE AND TYPE TO MEET EVERY DRILLING REQUIREMENT

12PA—94' welded and painted
12PE—94' bolted and galvanized

17PA—129' welded and painted
17PE—129' bolted and galvanized

17PS—136' welded and painted
17PSE—136' bolted and galvanized

18P—136' welded and painted Available with 1 or 2 bulges. Load rating 800,000 lbs.

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How 'safety-circle' driving cuts down accidents

"Know your safety-circle!" is an important lesson taught Standard of California drivers...and perhaps it can be helpful to you.

Your safety-circle is the distance you need to meet an emergency situation—a car stopping suddenly ahead, for example. Our drivers get a special test which tells them exactly how fast they react, but in general, it takes the average person a full second to see a hazard, think what to do and act. So, driving on a clear road, at 30 miles an hour, you should stay at least 7 car lengths behind the car ahead; when you drive 45 miles an hour, stay behind 13 car lengths.

More than 5,000 Standard drivers have studied this and many other safety principles in our Driver Training Program, besides passing thorough visual examinations. Last year, they drove 41 million miles with an accident rate 60% lower than the national trucking fleet average.

STANDARD OIL COMPANY
OF CALIFORNIA
plans ahead to serve you better

increase in pipeline demand, the power output of the unit increases rapidly. It should perhaps be emphasized that these curves do not reflect changes in component efficiency with changing flow conditions, and therefore show a net power output and thermal efficiency which are somewhat greater than will actually be obtained. In general, a 10°F. change in ambient air temperature will produce a 4-5 percent change in power output.

The amount of regeneration to be utilized must necessarily be determined by an economic study, in which the increase in first cost for various percentages of effectiveness is evaluated in terms of the increment of thermal efficiency which results. Intimately associated with the first cost of the regenerator is the pressure drop which can be tolerated. As previously shown, the effect of such pressure drop is to decrease the effective turbine expansion ratio, and thus decrease the total power ouput of the turbine. It may be shown that, with negligible error, the summation of the pressure drop on the air and gas sides, expressed as a percentage of the absolute pressures,

$$(\text{ie}: \left[\left(\frac{\Delta P}{P}\right)_g + \left(\frac{\Delta P}{P}\right)_a\right]) \text{ is a}$$

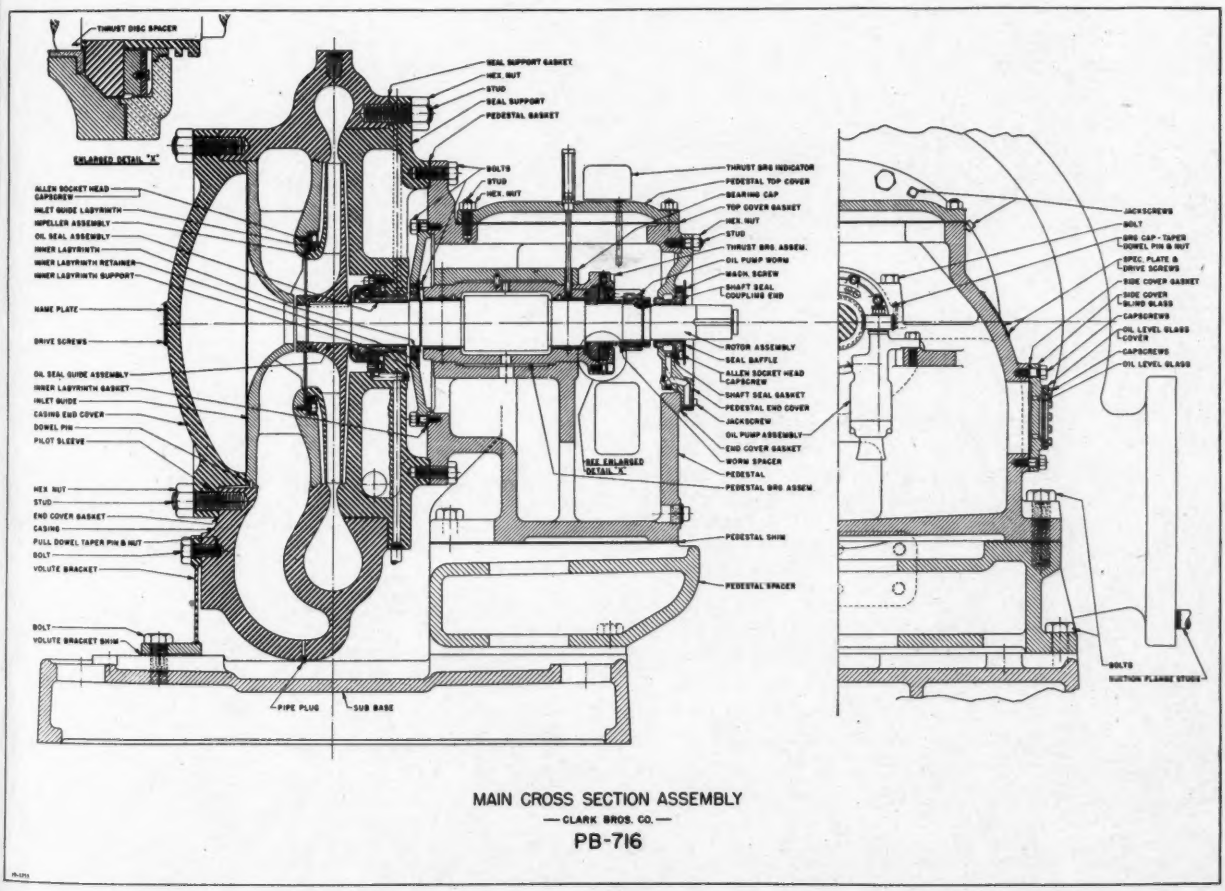
measure of that portion of the ideal total power output of the turbine which is obtainable. This is indicated by the curves of Fig. 5, in which the percentage of total ideal turbine power output, obtainable by isentropic expansion, is plotted as a function of this factor for several expansion ratios. Such a relation is of particular value, since it becomes possible to specify to the regenerator manufacturer the summation of the percent pressure drop on the air and gas sides, allowing the actual distribution of these pressure drops to be selected as required by his particular design.

The effect of altitude on the capacity of a given unit is also of considerable importance. As the altitude at which the installation is made increases, atmospheric pressure of course decreases, with a resultant decrease in air density. The net output of the turbine thus decreases approximately in direct proportion to the density, as shown in Fig. 6. This curve is predicated upon constant ambient and turbine inlet temperatures.

The values of compressor efficiency which have been used herein are relatively high, and are obtainable only with an axial flow compressor. For small units, where efficiency is of less importance than first cost, consideration should be given to the use of a centrifugal compressor. By so doing, an appreciable reduction in first cost may frequently be realized.

It may be expected that gas turbines for pipeline application will be required to exhibit good partial load efficiency. To obtain this, the use of a two shaft turbine construc-

(Continued on Page 48)



MAIN CROSS SECTION ASSEMBLY
— CLARK BROS. CO. —
PB-716

Figure 7

The chances are that you can handle many of the problems of operation with your own refinery staff. But what do you do when you need help . . . when these problems gang up on you or when you meet a really serious problem? Do you "CALL UOP"? It is your assurance of assistance in solving any of the technical, physical, economic or operating problems of refining.

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LABORATORIES: RIVERSIDE, ILLINOIS

Universal Service Protects Your Refinery

Kern County OIL NEWS

ALL THOSE WHO are "heavy crude burdened" have been promised rest. This promise comes from new sources "optimistic" as complainants are slowing down along with their production.

IN OTHER WORDS it's a lot of oil that has no turning and many now feel that the situation . . . can't last too long for Kern as its oilwigs believe that where there is a demand there is a way or vice versa.

"DISAPPOINTING" . . . is the word for the CARISSA wells. Only because the brains have missed in Cuyama and Edison Basement, is there any drilling. Then too "San Andreas" is active over Elk Hills way and there is a lot of oil . . . of course one field is farther away from the actual fault.

EDWIN JAMES chemical engineer for Shell has been transferred to Los Angeles. Mrs. James who was secretary to Frank Hornkohl accompanied her husband and resigned from Hornkohl Laboratories subsequently.

STAN BECK has been doing some paleontology for Carissa Plains and reports that oil used to be there and that somewhere around there, there has to be oil. There there's enough there's. Let's find some orl.

C. A. DIMITRIU petroleum engineer for SHELL is a guest of Kern County from the Isle of Trinidad. DIMITRIU is a Roumanian now without a country almost since the transfer of idealogical principles of yesterday have been supplanted by new vested interests of today. Resolving of all differences has not been stabilized. K. E. PEDERSEN division drilling foreman was hosting him around when we ran across him the other day.

OILWIG SOCIETY NOTE: From East Bakersfield to our knowledge only one geologist's son is going to Berkeley (U.C.), JIM WEDDLE to study geology. However, Jimmy's cronies to arrive at "UC" early this month are Steve Tomkins, engineering and football (Jim swims) And GEORGE PAULOS, dentistry some football and lots of track. George won the Eric Johnson scholarship.

ONLY GIRL from EB to attend UC is JOAN DOWNEY to major in sociology, nearest phonetic to geology.

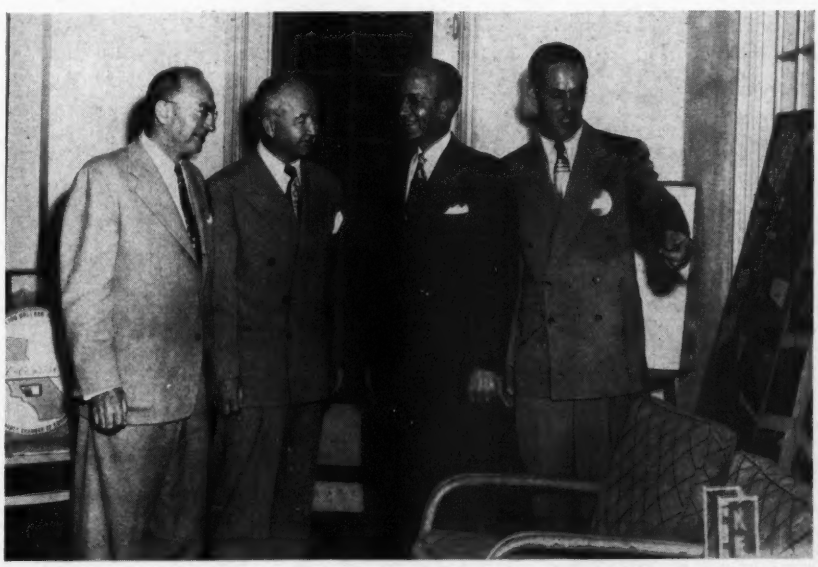
SUE HOWELL (Shell's Oliver) tells us that her mother and HERM WEDDLE'S wife went to school together in NAPA county. Reminds us of Herm himself who told us that his three weeks vacation begins this month. Wished he could fish in Mexico instead of the mountains this year, but we think he wants to wish our Oilwig To Mexico Trip . . . well but not oilwell.

AL KERR oilscout for Ohio is leaving the oil fraternity to teach in Long Beach Junior College. His work will be vocational in that he will teach and practice or experiment with geology and engineering. Good luck AL.

MAXWELL CAPEN, geologist . . . for Seaboard is secretary for the San Joaquin Geological Society, affiliated with APG . . . reports recent activity of the association, but nothing particularly on the agenda at this time has come in.

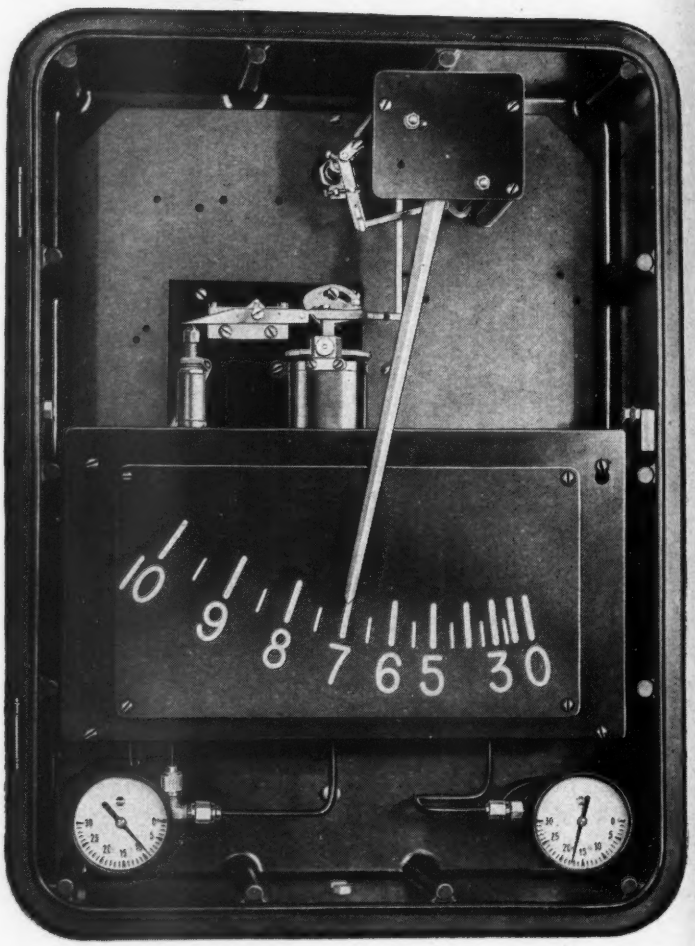
PAUL J. HOWARD our well known kernwig authority on consulting has gone up to his high Huntington Lake home on the Sierra range. Just heard he was going to Mexico . . . tried to reach him but the usual report. "ASRPHBD". (at subscriber's request phone has been discontinued) June, July and August . . . this has been going on for fifteen years.

RALPH BRODEK of Western Gulf scouting told us that the San Joaquin Scouts had elected as usual at the half year mark new officers. Retired from office are FLOYD TINSCHER of Union Oil, chairman; AL KERR, Secretary Treasurer; and BOB RIST of Standard,



CHAMBERWIGS OF OIL—RON KAEHLER, president S. F. Stock Exchange; EARL GROVER, president L.A. Chamber of Commerce; G. LEWIS FOX, general manager S.F. Chamber of Commerce and CECIL T. JONES, president Kern Chamber call attention to an oil exhibit at Stockdale Country Club where the foursome gathered for the 42nd. Annual Meeting of the Kern Chamber.

8 STAR SERVICE-FEATURES PNEUMATIC



1. **NO NEED TO BREAK TUBING CONNECTION** for nozzle adjustment.

2. **INSTRUMENT CAN BE REVERSED** by shifting one link without disturbing other adjustments.

3. **LINKAGE ALIGNMENT MADE EASY IN FIELD** with positioning device.

4. **MAXIMUM PROPORTIONAL BAND CHANGES** with minimum output pressure changes.

Many maintenance and servicing problems are answered with completely new design-concepts in this Series A-88 pneumatic Transmitter and Controller, operating on the standard 3-15 psi air pressure range.

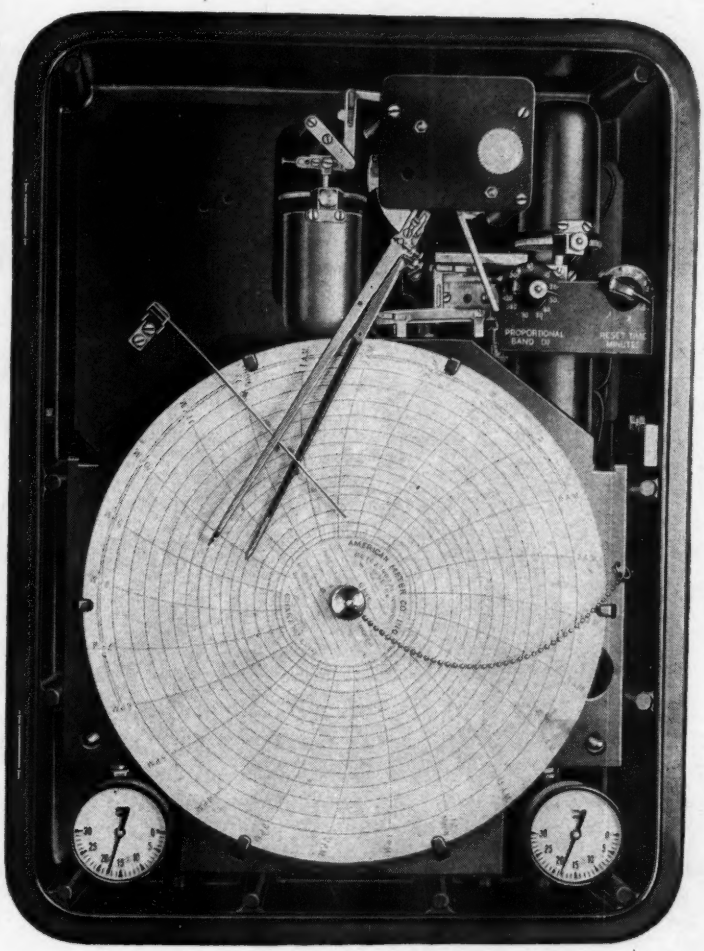
A new minimum of pivot points is achieved through the reduction of moving parts. There is complete accessibility to all adjustments.

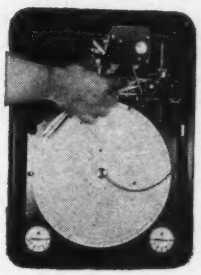
These features not only reduce servicing demands and maintenance expense but contribute greater ease of adaptability to the control of flow, pressure, liquid level, and specific gravity.

The new die-cast aluminum cases may be fitted into the same panel openings provided for many previous models.

The high degree of interchangeability of parts and sub-assemblies make the new Series A-88 pneumatic Transmitter and Controller readily convertible to changing conditions with a minimum of trouble and expense.

OF THE NEW SERIES A-88 TRANSMITTER AND CONTROLLER





5 **EASY POSITIONING OF NOZZLE** permits widening of proportional band without disconnecting tubing.

6 **DAMPENING DEVICE IN RELAY** insures smooth operation. Primary orifice in relay is self-cleaning.

7 **RESET VALVE IS SPRING-CLOSING** and hermetically sealed with bellows. It is calibrated according to time.

8 **LINEAR ADJUSTMENT** between transmitter and receiver.

FOR COMPLETE INFORMATION

Write for Bulletin CT-49, illustrated to the right. Servicing and Operating Bulletins furnished with each instrument.

See the display at our Booth Numbers 732, 734, 736, National Instrument Conference and Exhibit, St. Louis, September 12-16, 1949.

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Executive Committee Chairman. Elected and installed for the last lap of 1949 are: HENRY CLARK of Gee Pee as chairman; DAN SULLIVAN of Continental as Secretary Treasurer; and RALPH BRODEK Executive Committee Chairman.

SPEAKING OF 30,000 years or so ago ALEX CAMPBELL and JOE SHELL out at Fruitvale with the Atlantic Drilling Company picked up a prehistoric camel bone at 3700 feet. The bone an identifiable rib part of its anatomy was either an early pliocene or late miocene specimen and said to be either 50 or a 100 million years old. This TULARE formation is in contrast to the McKittrick camel so sharply that laymen are confused with 30,000 years and 50 million anniversaries.

THE CHARLES MANLEY'S postcarded from McKinley Park Alaska and confirmed the fact that great scenery and interesting historic form lure and lore for the traveller. The Oil Field Construction Company's Manley vacations as hard as he works.

SPEAKING OF TRIPS, Charley Lake is in Europe. Hasn't been there since World War I days. Report has it that if there is anything to speed up recovery over there, Dwight Bovey will press the Western Oilfield Supply Company's knowhow into action. In all seriousness Kern appreciates the advancement made in both oilfield needs and farm needs since the postwar period, that was carried on by this firm.

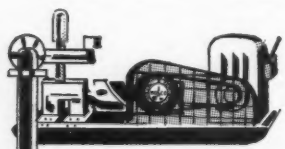
THIS IS THE LAST month of the vacation season and many oilfolk are now embarking upon trips . . . few have returned as yet from anything but a fishing trip or two.

ON THE WAY BACK from a trip to the coutrhouse we almost ran right into Mrs. TINE GAISER. This was an opportunity to talk a bit and she was telling us how TINE had been persuaded in having a vacation. It was some job to get him quiet . . . for (two weeks . . . O no . . . two days) rest of the time it was long distance and wireless from Catalina. Finally she gave up and Tine gave up . . . business sometimes is a jolly happy hobby.

TED WALTIMIRE is a good guy . . . but hard to find unless one keeps oil industry hours. If anyone sees Ted tell him we got an order for some new business . . . we call too late and get home too early for Ted. We just want a small overhead crane for a bath tub if he has it.

ANOTHER BUSY person or persons. Phoenix, Phoenix and Phoenix. This is road building weather and Oilfields Trucking Company has a new franchise, hauling unitized equipment for the Rocky Mountain areas.

WE MET AN AWFUL nice guy the other day. He has Industrial Precision Company, but that is not all . . . he has a lot of fun along with it. Not only does he build and fly or glide gliders . . . "soaring to him" . . . but he broke the world's record recently over Minter Field when he past the 93 loop count and made it



WATER *Anywhere!*

Complete RENTAL SERVICE

- **RENTAL PUMPS** are portable, skid-mounted, gasoline or Butane powered units capable of high pressures and adequate volumes.
- **RENTAL TANKS** are very portable, skid-mounted, 157 barrel capacity, sturdy tanks, and are legal highway size, 8 feet by 18 feet.
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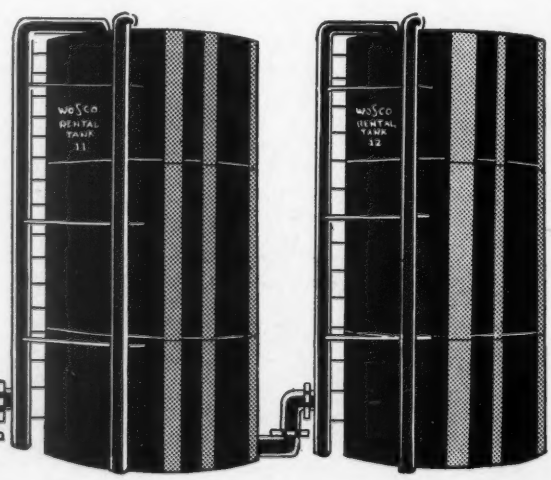
WoSco's inexpensive, rapidly installed rental pipe service will get you water anywhere you want it—when you want it.



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Pipe For Every Oilfield Need

WESTERN OILFIELDS SUPPLY CO.

a 135. Soaring is difficult on the oil industry as very little oil is used in soaring . . . however, again . . . when the 24,000 cars lined up to see MAURICE LINDSAY break the record all started out with full tanks of gas.

ONE DAY last month Kern oilwigs read two stories both identical concerning behavior of four persons. In one area of the county a young couple was applying for divorce. Reason John would not let Mary eat hot dogs. In another area divorce pleadings were heard because Mary could not get John to go to church. John professed he had too much religion.

THIS MONTH oil companies were contacted relative to furnishing small sample barrels of oil to be given away at service clubs . . . to visiting oilwigs and firemen . . . for conventions and someone suggested they be given out at Mexico City. Kern's bales of cotton in miniature have long been a popular souvenir. Since some of the companies sell fertilizer for cotton these bales have not escaped demand from oil folk either.

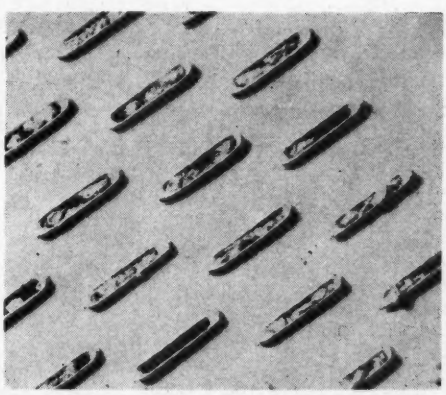
WORLD WIDE ATTENTION is being given to PREHISTORIC DIGGINGS now going on at McKittrick. Work is being carried on by the LOS ANGELES MUSEUM with GEORGE P. KANAKOF directing. Assistance is being given by Kern County Museum and others under F. F. LATTA curator. Kern is proud of its discovery by JOHN B. STEVENS, Tide Water Associated Oil Company geologist retired. Stevens is standing second from left. He discovered the asphalt pits in 1921.

MR. DRILL RIG OPERATOR:

This ⟶ could be

Your Radiator! --

and it's 87% inefficient!



As you see in the picture iron oxide tubercles and mineral scale wash down from their starting points in the engine block and lodge tightly in the narrow tubes of the radiator core. Greatly reduced circulation of cooling water results in acute power losses engine breakdowns, costly repairs and job delays.

SirVece of California, through years of research and hundreds of test applications, has perfected the Hydro-Magnetic Cooling System Cleaning Unit (patent applied for) which produces immediate, effective results in returning to overworked engines a maximum of coolant circulation and a minimum of working strain.

Highly trained field men in travelling laboratories bring Hydro-Magnetic to your rescue, in the field or in your yard, to carry on operations whether your engine is working or idle. Complete radiator repair service is available, and recommendations for preventive water treatment are given without charge.

Try the SirVece Hydro-Magnetic Method now! Call or write for details today!

SIRVECE of CALIFORNIA

Bakersfield, Cal.—Phone 4-7345 or 7-7551
Norwalk, Cal.—Phone Torrey 6-6998

Save LINKS SWIVELS AND SWIVEL BAILS from wear

WITH THE NEW PATTERSON-BALLAGH Link Bumper

Here's an economical way to reduce wear on expensive equipment. Protect your links, swivel bail, and swivel from constant pounding with this new, low-priced LINK BUMPER. Made from tough wear-resistant rubber, this bumper holds the link away from both swivel bail and swivel to prevent wear at those two vulnerable points. Clamps may be loosened and bumper rotated to get double wear from each Link Bumper.

These Patterson-Ballagh Link Bumpers are easy to install. Each bumper is cut on one side as shown in the enlarged view. The bumper is quickly snapped over the link at swivel body height and made secure with clamps at each end. Streamlined shape with recessed clamp prevents catline and equipment from being fouled.

POPULAR SIZES AVAILABLE

Size Link	Dia. Link Shank	Overall Bumper Length	Bumper Dia.	Code Name
1¾"	2⅜"	12"	7⅜"	BAILEE
2¼"	2⅞"	11¾"	7⅜"	BAILOR
2¾"	3½"	11⅜"	7⅜"	BAILMENT

Link Bumpers more than pay for themselves by saving expensive equipment from needless wear. Ask your Patterson-Ballagh man about these new bumpers and then install a set on your links.

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SPEAKING OF STOCKDALE reminds us that LLOYD TEVIS president of Kern County Land Company passed away just a half century ago. The growth of Kern County was in testimonial on the half century anniversary eve of his untimely passing, within earshot of the old Tevis Home which still landmarks the country club.

YES THAT IS RIGHT . . . Oscar Greene popular major domo of the Stockdale Club was married a fortnight ago to Catherine Pasco of the popular Pasco Kern River resort family.

JAMES W. TRAVERS of Taft has gone to his reward after a colorful career as a writer. For the last eight years he had lived in Taft and probably is the only Californian except the late Edward L. Doheny who ever predicted an oil field. At 80 after having been but a short time in Taft he brought about interest in developing the Cuyama Valley for oil . . . and predicted its virtual outcome and success. He had owned acreage for 40 years.

TAFT AND KERN COUNTY lost another colorful oilman in his early fifties. HERB GOLDMAN as he was so well known was one of the finest of our citizens. Vice president of the Petroleum Supply Company he had moved to Bakersfield in the early thirties from Taft. His passing was such a tremendous shock to all of us. No other person in our memory had so many civic, fraternal, religious and veteran activities as Herb. He gave the community something for everything it ever gave him. He was a grateful person.

WEDDING BELLS rang for Joy Deane Tillet and Roy Barnes of Taft. After a honeymoon at Morrow Bay the young couple returned to their home. Roy Barnes is with the Standard Oil Company. Also returned home are the Ivan Nichols'. Mrs. Nichols was the former Imogene Turner of Taft. Ivan is with the Belridge Oil Company.

ANNUAL KERN COUNTY FAIR plans are now under discussion and execution. As usual nothing in premiums is posted for petroleum. State Fair is no exception save for $30.00 total allowed for oil exhibits. Someday this may be corrected. Lack of interest by oilwigs is said to be chief reason.

FIFTY YEARS ago another big oil strike was found up the Kern River on the Means ranch 150 feet upriver from the Elwood well. A hand spade turned over seepy oil sand loaded with oil as the warm sun melted away the contents.

SPEAKING OF ANNIVERSARIES and discoveries . . . Kern County Board of Trade (now Kern Chamber) was organized 1908 and at this same time when Kern started advertising its resources . . . the CALIFORNIA OIL WORLD started out to advertise some of the resources of the trade. Both organizations have moved forward in the increasing returns of commerce and industry. If Kern County became wealthy and well known in spite of either of them . . . then it is certainly important and necessary that

Serving

12,000 Customers

in

Kern County

KERN COUNTY BANK

TAFT • OILDALE

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

JOHNSON VALVE SHOP

SPECIALIST

IN HARDFACING VALVES

for

LASTING DEPENDABILITY

Bakersfield, California

3732 Chester Ave.

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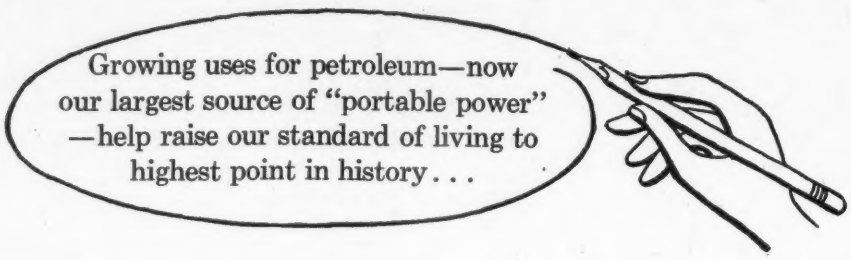
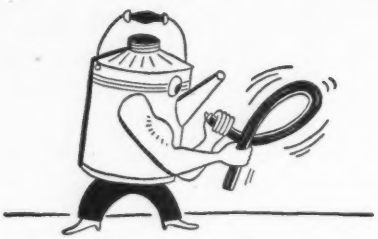
P. O. Box 624

What does comfort cost per pound?

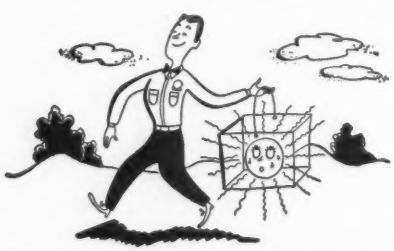
Here's a new way to look at any Shell product


Growing uses for petroleum—now our largest source of "portable power" —help raise our standard of living to highest point in history . . .



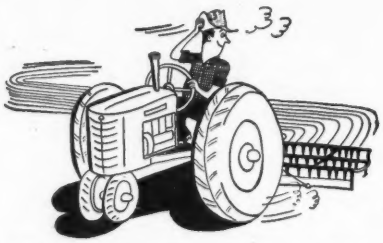
Strong man for sale:

An ancient dream of "easy living" was to own Aladdin's lamp, and "wish" the hard work done. Now the dream comes true. Petroleum and natural gas furnish 48% of our energy requirements. Petroleum is easy to buy at reasonable prices, *anywhere* in America. And it's ready to tackle almost any job you ask.



Take home some sun:

Let's look at a gallon of Shell fuel oil, for instance, in a new way. It costs you about half as much as a pack of cigarettes—but you're actually buying something more than a *product*. Your gallon of fuel oil is really "7 pounds" of portable summer weather—to warm your home . . . protect your family from the winter cold.



Faster farmwork:

Give a farmer a gallon of Shell diesel fuel, which will weigh about 7 pounds, and you're giving him tireless mechanical muscles. You're helping him cultivate a lot more land in less time. You're giving him an easier life. And incidentally, you're helping him give a lot more food to a very hungry world.

For 2 ice cream cones:

A gallon of Shell gasoline costs—without taxes—about the same as 2 large ice cream cones. It contains the energy to transport you and your family 15 to 20 miles . . . on business, errands, or recreation. Petroleum is *portable power* available—for your comfort and convenience—anywhere in America.

A forward-looking company serves all 4:

- *Consumer*
- *Community*
- *Employees*
- *Shareholders*

SHELL

SHELL OIL COMPANY
INCORPORATED

they have them now.

OILSTERS and their associations will be happy to know that Kern County will participate in census tracts come the taking of the new 1950 census first of the year. Counting by townships is a practical way by enumerators . . . but the information is usually sequestered and not well organized by local persons sufficiently and efficiently to earn ready returns to local people.

HARRY A. HOPKINS and families are touring the Yellowstone Park areas. Harry will enjoy the trip now that the assessed valuation has been revealed at over a half billion dollars. To be exact almost it is $521 Millions. However, Harry says that while the rate may be less now, the tax is still there and that there is too much of whatever value there having to be raised.

WALTER MANSFIELD taxpert for the county . . . a budgeteer . . . now known as chief administrative officer has a most excellent talk on taxes. He makes one feel better even if his taxes are just as many. Kern is by no means the lowest rate and naturally not by any means the highest. Suggestion is that you write him for his summary or have him come down or up and speak to you sometime.

The rig on the left is Independent Exploration Co.'s Newhall-Royal Comm. No. 2, Gene Reid Drilling Co., contractors, in the Placerita Field. Rig on the right is Shamrock Drilling Co.'s Bertoglio No. 1 in section 31-4n-15w. The road in the foreground is entrance from highway U. S. No. 6 to the mesa about 1800 feet elevation where activity is located in Placerita Canyon.

— — Representing — —

•

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Box 286 17th & Phoenix
Tulsa 1, Oklahoma

•

PUMPING WELL EQUIPMENT
Casing & Tubing Heads
Tubing Hangers
Pumping & Flowing Tees
Duplex "Cone-Pak" Stuffing Boxes
Tubing Spiders
Combination Globe & Relief Valves

•

"HERCULES RED TOOLS"

•

L. T. "TED" WALTIMIRE
Manufacturers' Representative
P.O. Box 1612, 1221 33rd St.
Bakersfield, Calif.
Phones 4-4169 - 2-8493
Sold *Exclusively* Through Supply Stores

FORMATION LOGGING

an improved Logging Service from Drill Returns offers the following advantages:

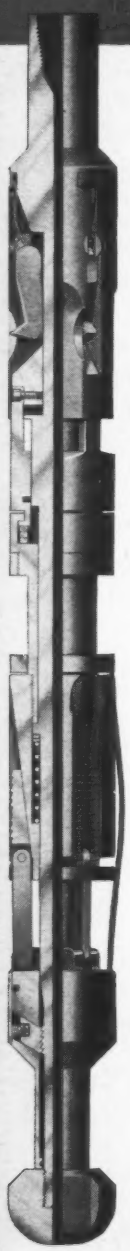
1. A Way of Drilling Expensive Wildcats Substantially Cheaper
   a) By coring only when there is something to core
   b) By testing only when there is something to test
2. Tangible Direct Evidence of oil and gas formations under all conditions—"when you can't tell from the electric log"
3. Continuous Gas Check for
   a) Positive identification of gas sands—including small ones
   b) Blow-out Protection
   c) Structural evidence—it helps in evaluating the prospects of a wild cat "further down."
4. Permeability information in Interpretive Log based on "Jetting Lag."
5. A competent logging job and 24 hours surveillance of your well by Petroleum Engineers and Geologists

FORMATION LOGGING SERVICE COMPANY
(Peters Logging Service)
220 Haberfelde Bldg. BAKERSFIELD, CALIF. Tel. 2-0773

Inside Tips ON INSIDE CUTTING JOBS!

To cut down your risks and eliminate second-guessing on inside pipe cutting jobs, Bowen has developed a *special method of cutting* that insures you the safest, easiest and most efficient job possible!

It's a combination of the regular Bowen Internal Pipe Cutter, and accessory equipment especially made to provide the ideal downward weight on the cutter knives for the particular grade, size and weight of pipe to be cut. With this equipment, weight on knives is exactly right to give you clean, accurate cuts without tool chattering or crawling, regardless of pipe size!



CUTTING WEIGHT PREDETERMINED

In the accessory equipment illustrated at right, the Pre-determined Cutting Weight is simply the number of joints of the cutting string required for proper downward pressure on the knives . . . and this data has been worked out by Bowen for every size of casing, drill pipe or tubing you may have to cut. The run-in string is held in tension above the assembly by means of the expansion joint shown, so that only the proper pre-determined weight is allowed to feed the knives. A stabilizer is provided to center the cutting tool in the hole and insure full-diameter cuts. Once the cut is complete, elevating the cutting string restores the entire assembly to a run-in position and it may either be raised or lowered for additional cuts *without coming out of the hole!*

The Bowen Internal Cutter is ideal for use with the Bowen Jar and Spear for all types of cut-and-pull operations. It is carefully built of the finest materials, is of simple rugged design, and can be obtained in a full range of sizes—complete with accessory equipment—from your nearest Bowen Service Store.

24 HOUR SERVICE
IN ALL ACTIVE CALIFORNIA FIELDS!

BOWEN FISHING TOOL COMPANY
SANTA FE SPRINGS, CALIFORNIA
VENTURA • BAKERSFIELD • AVENAL • SANTA MARIA
CASPER, WYOMING
Export: S. R. BOWEN CO., 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

Personalities IN THE NEWS

Mr. Byron O. Lilly, Hughes Tool Company Pacific Coast Sales Manager, with headquarters in Compton, California.

Maynor (Oscar) Shove, Southern California public relations manager for Shell Oil Company, has returned to his Los Angeles office from his vacation at Falling Leaf Lake near Lake Tahoe.

A. H. Heller, geologist, engineer and Cuyama Valley oil developer, has left Los Angeles for a sojourn in Europe. During his stay across the water, he plans to make headquarters in Paris, France.

John R. Christie, Dan B. Miner Advertising Agency, Los Angeles, is directing the class in case histories at the school of financial public relations at Northwestern University. The class opened August 1 and will close on the 15th of the month.

Subsidence in the Long Beach-Los Angeles Harbor area was discussed by Robert R. Shoemaker, chief engineer, port of Long Beach at the meeting of the California Natural Gasoline Association. The meeting was held at the Rio Hondo Golf Club.

Ventura County pioneer days were revived recently when a Shell Oil Company crew dug up an old mill wheel while excavating for a pipeline. The wheel, originally imported from Germany, is made of solid granite blocks, belted together and bound with a solid metal band. Farmers in the 1870's used this type of wheel in their mills for grinding wheat. Members of the crew were A. B. Craig, F. L. Yost, Charles Thompson, Jr., L. E. Peters, J. A. Windsor, and P. M. Taylor, Jr.

Leo H. McGowan, 61, chairman of the board of the Standard Steel Corporation, Los Angeles, died at his home, where he had been confined for several months with a heart ailment.

Harold E. North, Southern Counties Gas accounting department, has retired following 20 years of service with the company. North and his wife, Myrta Hensley North, reside in Westwood. They are the parents of one daughter, and have two grandchildren.

James W. Travers, 83, a leading figure in Cuyama Valley oil development died in Taft. Born in Oakland, Travers' father was a clipper ship captain and brought boats around the Horn in the gold rush days. Travers at his passing held thousands of acres of leases in Cuyama Valley. He was the only living charter member the Native Sons of the Golden West, Oakland parlor.

Leigh Battson, head of the Doheny interests, is spending some days this summer at his Arrowhead Lake residence. He recently returned from a European tour.

Mr. Swanson Hargon, Hughes Tool Company Division Engineer, with headquarters at Compton, California.

Harry E. Ransford, editor of Signal Oil Company's Signal News, points out in a current issue of the magazine that Americans can boast of possessing the world's smallest oil refinery. The largest in the world is at Iran. The small, unique refinery has a yearly output of only 40 gallons of lubricating oil, but its product brings more than $1000 per gallon, Ransford explained. Located at Elgin, Illinois, the small refinery produces the most perfect watch oil ever devised. Although nearly 75,000,000 Americans own watches, less than 18 gallons of oil will lubricate them all.

Tom Simmons, president of Bolsa Chica Oil Corporation, was host at a barbecue picnic at his beautiful Suzy-Q Ranch at Puente. More than 200 friends gathered at the ranch. Many dipped in the pool or rode some of the Simmons' fine Tennessee walking horses. Oilmen in attendance included Harold Pauley and George Ring.

Why gasoline costs you less today than it did in '39

	Gasoline per gallon†	State and Federal tax per gallon*	Aver. hourly wage°	Approx. hrs. to earn 10 gallons plus tax
1922	24 8/10¢	4/10¢	.52	5
1939	13 4/10¢	6 4/10¢	.63	3
1949	20 4/10¢	6 9/10¢	$1.37	2

†Average 50 U. S. cities. Includes all taxes except Federal and State highway taxes.

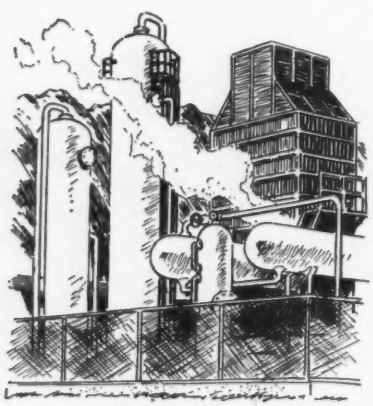
*Average for 48 States.

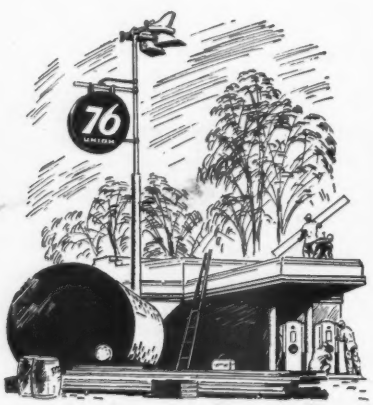
°U. S. Bureau of Labor statistics for factory workers.

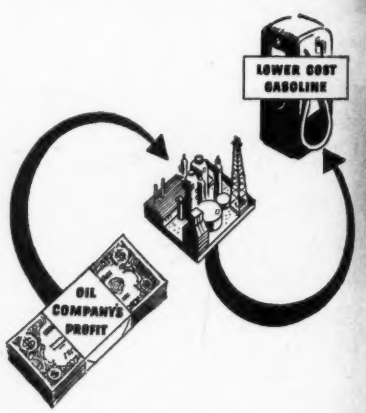
1. The price of gasoline today is higher than it was in 1939. But it actually *costs* you less. In 1939, for example, 10 gallons of "regular" gasoline cost the average U. S. factory worker 3 hours' pay. Today, 10 gallons of considerably *better* "regular" gasoline costs him less than 2 hours' pay.

2. In 1939 one bushel of wheat would buy the average U. S. farmer 3½ gallons of gasoline. Today, one bushel will buy him 7.9 gallons. And what is true of the factory worker and the farmer is true to a large extent of most other gainfully employed people in this country.

3. In other words, the price of gasoline has gone up less than wage rates and less than the price of most other commodities. Consequently, it actually costs you less in "real" dollars than it cost you in '39. What's the reason for this? Are the industry's labor costs down? No. Oil workers are among the highest paid wage earners in the country.







4. Are the industry's raw-material, tax and other "cost-of-doing-business" expenses lower? Quite the contrary. Are the owners taking less profit? No, dividend payments have been running higher, although they average only about 3½% of gross sales and represent a return of 4½% on invested capital. What is the answer then? Simply this: greater efficiency and lower costs through more and better "tools"—refineries, terminals, pipe lines, drilling rigs, etc.

5. Since 1939 the industry has not only plowed back *every cent of profits* after dividends into enlarged and improved facilities but has *borrowed* additional money as well—all in order to meet the increased demand for petroleum products and to improve efficiency. In the last 10 years Union Oil—in addition to $178,000,000 used for replacement—has spent $80,000,000 on "plant" improvement and expansion.

6. 64% of this came out of profits that were left over during those years after dividends. The rest was borrowed. So oil company profits have a very real bearing on keeping down the cost of gasoline to you. For most profits go right back into improved facilities that mean greater efficiency and lower costs.

UNION OIL COMPANY
OF CALIFORNIA
INCORPORATED IN CALIFORNIA, OCTOBER 17, 1890

This series, sponsored by the people of Union Oil Company, is dedicated to a discussion of how and why American business functions. We hope you'll feel free to send in any suggestions or criticisms you have to offer. Write: The President, Union Oil Company, Union Oil Building, Los Angeles 14, California.

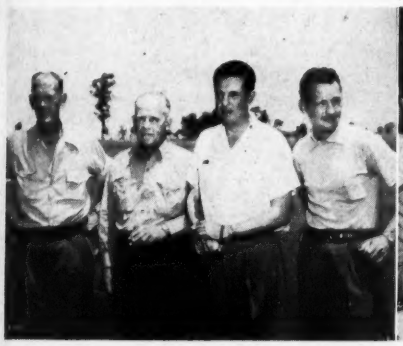
Nomads' Whing Ding Big Success

July 15 was a great day in the life of Lee Laird and his Los Angeles Nomads, for it marked one of the most enjoyable gatherings ever engineered by this estimable group of far-traveled oil men. Over 300 members, guests, and friends attended the function and had the time of their lives. Ted Forsyth, the cheerful Emsconian with the widely parted hair, was in charge of all arangements and with the assistance of Jim Hughes, Knight Templeton, and Jerry Engstrand, he certainly did a bang-up job.

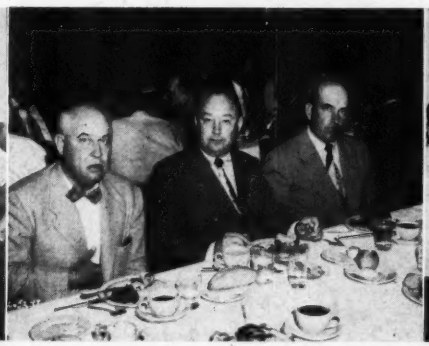
With Bill Wilson as starter, the golfers began chopping at the tall grass in the early hours of the morning and they continued until every bit of vegetation had been driven back into the ground. Bill, incidentally, appeared in a multi-colored shirt of such blazing luridness that George Trembley wasn't even missed. Winners of handsome prizes for proficiency in the earth flailing bracket were Lawrence Stanfield, Bob Marshall, Tom Bell, Max Campbell, Hal Finney, Harold Atkins, and John Robinson.

Ray Humphreys, the Axelsonian Tex Rickard, marshalled a formidable array of croupiers and took care of the junior Monte Carlo that was set up in the late afternoon. This consisted of such interesting pastimes as Ebony John, speckled cubes, the ball and whirlgig, and an Eskimo practice known as Chukaluk. For prowess in these futile arts fine prizes went to Buz Lease, Tiny Bush, Warren Johnston, Jim Watts, C. M. Williams, George Morton, and H. Therolf.

Then there was a group of amiable lads who received substantial baksheesh for merely having the right numbers on their ducats. They were, to wit, and as follows: D. D. Long, Joe Schlarb, Frank Webb, Garth Nicholson, Dallas McGeehee, and Ray Newton. It might be mentioned, in passing, that the prizes for the various events were purchased by those rare purchasers John



Andy Anderson, Henry Huskey, John Flanagan, W. F. "Bill" Bettis.



Ernie Fowks, Ted Sutter, Hal Haney.

Vaughn Euge, Tiney Gush, Ernie Fowks, Bill Kinder.

Unidentified, Ham Bell, B. H. Burden, Jerry Engstrand.

Hugh Glen, Ralph Newhouse, Bill Kinder, "Fat" Dunlap, Bill Powell.

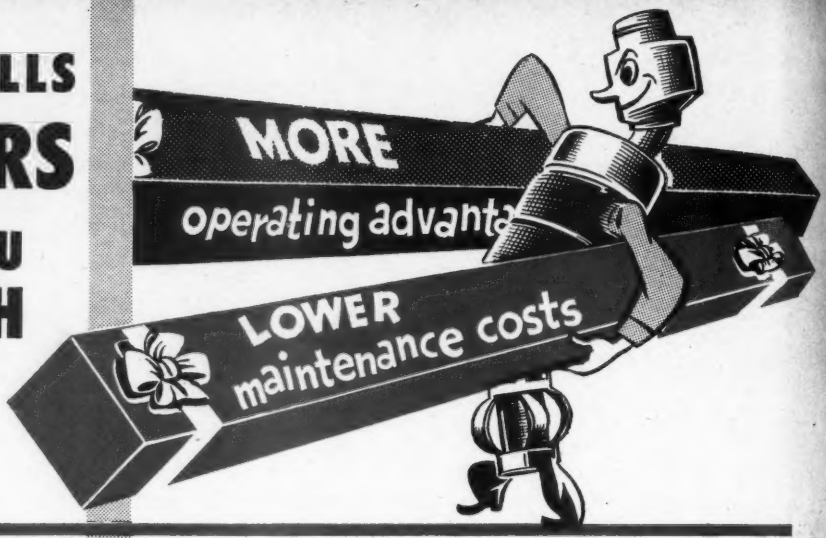
Don Dawkins, Bob King (standing), Vic Fawcett, unidentified.

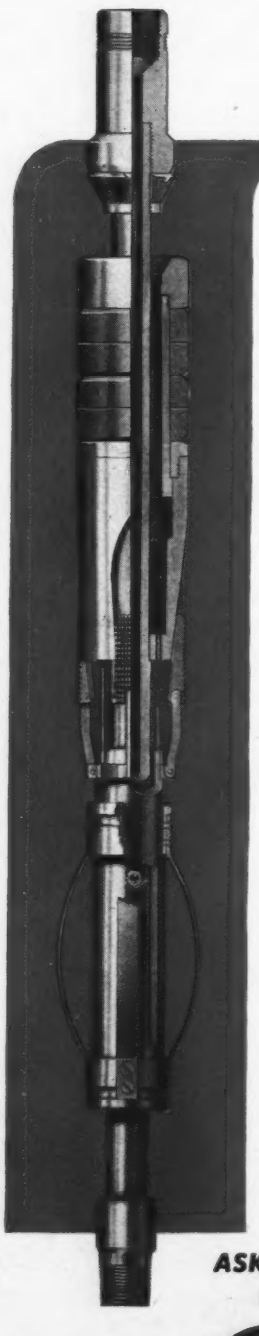
Paul Cavins, Mutt Donovan, Waldo Moore, Ray Stoy.

Van Loozen, Glenn Pitts, Hal Haney, George Winterburn.

Art Titus, Jack Wilcox, Warren Smith, Shan O'Conner.

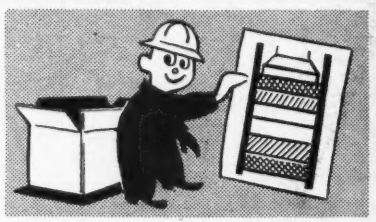
LANE-WELLS PACKERS GIVE YOU BOTH





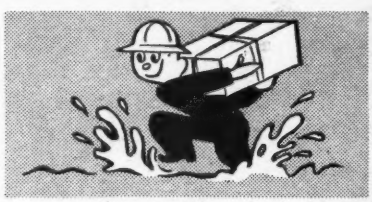
POSITIVE PACK-OFF

Outer rings of FLOSEAL Packing Ring Assembly control and confine "flow" of inner rings.



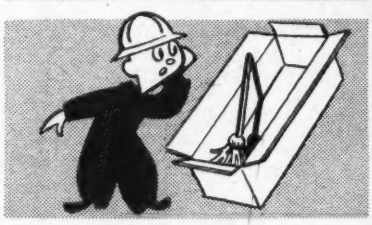
EASIER RUNNING

in fluid and increased circulation with generous by-pass area.



MINIMUM SWABBING ACTION

because FLOSEAL Packing Rings spring back to shape when released

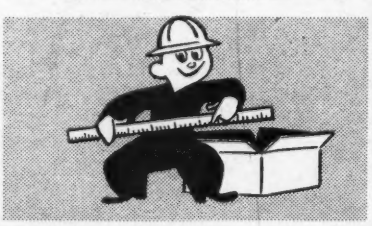


EXTRA-LARGE DOVETAILED SLIPS

ride in tapered grooves – can't get out to catch or drag. Crosscut wickers hold on hardest casing without shaving.

INSIDE DIAMETER SAME AS TUBING

to allow free passage of maximum size pumps, swabs, wire line instruments and other devices.

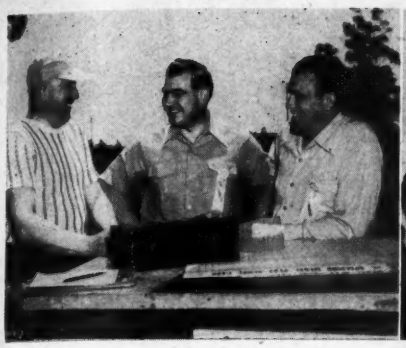


ASK THE LANE-WELLS MAN HOW THESE BETTER PACKERS HELP YOU PRODUCE MORE OIL AT LOWER COSTS!

LANE WELLS

LOS ANGELES – HOUSTON – OKLAHOMA CITY
GENERAL OFFICES, EXPORT OFFICES & PLANT
5610 SO SOTO ST., LOS ANGELES 11, CALIFORNIA

LANE WELLS SERVICE AND PRODUCTS ARE AVAILABLE THRU PETRO TECH SERVICE CO. IN VENEZUELA



Van Loozen, George Gutekunst, Joe Schlarb.

M. O. Johnston, Jr., Chris Elk, Hal Finney, Bob Medearis, John Fraser.

Ted Forsyth, Bill Wilson.

Isaacs and Bill Wilson, and whatever a door committee does was done admirably by Earl Rees and Knight Templeton.

The entire Whing Ding was a success from beginning to end and the show that topped off the evening was one of the best we have seen in a long time. Ted Forsyth was responsible for the selection of the vaudeville acts that made it up, and if he doesn't look out, the first thing he knows he will become a booking agent for television, or something equally awful.

Death Takes E. J. Burnell, Link-Belt Vice President

Mr. Edward J. Burnell, vice-president and general sales manager, and director, of Link-Belt Company, died at his home in Winnetka, Ill., on Friday, July 22, after an illness of several months.

Mr. Burnell was born in Tondu, Wales, Great Britain, April 7, 1888. He came to this country with his family and lived in Catasauqua, Pa., where he is being buried. He was graduated from Lehigh University in 1910.

Mr. Burnell served Link-Belt Company in many important capacities, in engineering, sales and plant management. He was a director of the American Mining Congress, Drexel State Bank of Chicago, Foundry Equipment Manufacturers Association, the Conveyor Equipment Manufacturers Association, and the YMCA of Hyde Park (Chicago).

During the war he served on the advisory board of Machinery Branch of War Production Board and the Chemical Corps of the War Department, and as Consultant to the Reconstruction Finance Corporation.

He served also as vestryman and senior warden of St. Paul's Episcopal Church in Hyde Park, Chicago.

His clubs are University, Economic, and Executives', all of Chicago, and Sunset Ridge, Winnetka. He leaves a wife and two children—Edward John, Jr., of Winnetka, and Mrs. Phyllis Burnell Tucker of Houston, Tex.

Rexton E. Fluke, technical service and research laboratory of the Texas Company in the Los Angeles Basin district, is Monarch of the Mizpah Grotto of the Shrine at Long Beach for the current year.

L. V. Phillips, pinch-hitted for Superintendent J. R. Scanlin at the Texas Company's Fillmore works, while the latter recuperated from an illness.

F. S. Wade, president and general manager of Southern California Gas, announces that he is relinquishing the title and duties of general manager of the company. He will retain the title of president, however. F. M. Banks, vice president and assistant general manager, will have the title of vice president and general manager.

Joseph E. Keller, attorney on the Washington staff of the National Petroleum Association and editor of the organization's Washington bulletin, recently resigned to give all of his time to the general practice of law.

C. A. Oberg, California Standard, San Francisco; Ralph W. Marshall, Drilling & Exploration, Los Angeles; and Nicholas D'Arcy, Huntington Park, will be among principal speakers at the annual meeting of the American Association of Oilwell Drilling Contractors. Contractors will gather in Dallas, Texas, September 19-21.

I. C. I. Appoints Montana Representative

Mr. Robert Harcus, General Manager of International Cementers, Inc., has announced that ICI's wire line services are now available to operators through Montana Oil Well Cementers of Cut Bank, Mont.

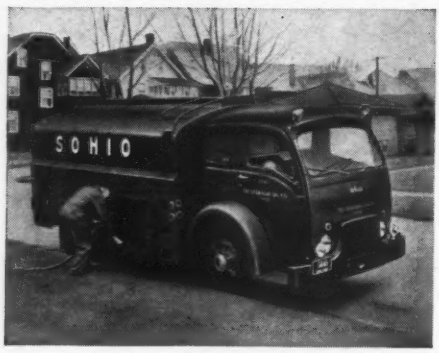
Harcus states that these services will include Perfo-Jet (Jet casing perforating), Strata-Jet (Jet formation penetrating), Plastic Cementing, Temperature Surveys, Bottom Hole Pressure Surveys, Baker Wire Line Bridge Plug, Baker Open Hole Bridge Plug, Baker Wire Line Retainer Production Packer, Electric Pilot Service, including: Caliper Surveys, Permeability Surveys, Water Locating Surveys, Selective Acidizing, Spinner Surveys.

Glenn Nelle has joined the General Petroleum Corporation as Assistant Manager of Rocky Mountain Operations, it has been announced by Max S. App, Director of Production.

Nelle will be located at the company's Casper, Wyoming, office and will report to A. F. Barrett, Manager of Rocky Mountain Operations.

Nelle, a graduate of the University of Texas ('39) in Petroleum Engineering, comes to General Petroleum from the Socony-Vacuum Oil Co. He has worked for that company, of which General Petroleum is an affiliate, since 1939. He was in Venezuela for the entire period. His last post was Assistant Manager of the Eastern Division.

HERE'S THE NEW TRUCK THAT "TIPS ITS CAB TO SERVICE"



A MACHINE TOOL OF TRANSPORTATION...the New White 3000 is a maintenance man's dream of perfect accessibility... saves hundreds of dollars a year in maintenance time costs. Workmanship is improved, too. On the job, the White 3000 is easier to maneuver and park in traffic. Saves running time and unloading time. All the quality and proved dependability of White Super Power truck units are built into the White 3000. See your local White Representative for all the time- and cost-saving advantages as they apply to your business.

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POWER-LIFT CAB is an exclusive White 3000 feature. The actuating mechanism is a rugged version of the dependable device operating landing gear on airliners. The turn of a key lifts the cab in less than 30 seconds.

White SUPER POWER 3000

FOR 50 YEARS THE GREATEST NAME IN TRUCKS

Pringle and Dahl Advance at Columbia Steel

O. L. Pringle has been elected vice president in charge of sales and Laurence S. Dahl has been elected vice president in charge of operations of Columbia Steel Company, effective August 1, it was announced recently by Alden G. Roach, president of this United States Steel subsidiary.

Mr. Pringle, vice president in charge of operations of Columbia Steel Company since 1938, is widely known in the steel industry. He will fill the position left vacant by the recent death of Frank B. DeLong. Mr. Dahl comes to Columbia from Carnegie-Illinois Steel Corporation, also a subsidiary of United States Steel. He has been general superintendent of Carnegie-Illinois' operations in the Youngstown, Ohio, district since 1947.

In announcing the appointments, Roach pointed out that Messrs. Pringle and Dahl were selected because of their experience and knowledge of production and distribution of steel products. He said the two vice presidents will work hand-in-hand in furthering Columbia's sales and production objectives.

Mr. Roach also announced the appointment of H. S. Worthington as assistant to the vice president in charge of operations. In his new position, Mr. Worthington will work closely with Messrs. Pringle and Dahl in coordinating customer requirements with the company's steel products and operations. He will also be concerned with the development of new steel products.

Petroleum Production Pioneers will hold its next barbecue in the Bakersfield area on September 10, according to Russ Green, president. The Kern County golf course has been chosen for the gala affair. Arrangements are going forward under the direction of "Pen" Penfield. He is receiving the enthusiastic cooperation of many San Joaquin Valley oil men, who promise to make this event one long to be remembered and the best ever sponsored by the Pioneers.

William M. Keck, Jr., vice president of Superior Oil Company, is back in Los Angeles from Washington where he was in attendance at a meeting of the National Petroleum Council.

R. D. Ford New Schlumberger Manager in Mid-Continent

Schlumberger Well Surveying Corporation, Houston, Texas, has announced the appointment of R. D. Ford as Manager of the Mid-Continent Area with headquarters in Tulsa. This position was formerly held by R. G. Hamilton who has resigned to do independent consulting work. C. K. Ruddick is Assistant Manager of the Mid-Continent Area.

So. Cal. Meter Assn. August Meeting Scheduled for 18th

The Southern California Meter Association will hold their August meeting on Thursday, August 18th, at the Rio Hondo Country Club, Downey, Calif. Dinner is scheduled for 6:30 p.m. and the meeting at 8:00 p.m.

Nels R. Swanson, Industrial Engineer with the Foxboro Instrument Company, will address the meeting. Mr. Swanson's paper will be: "Measurement of Differential Pressure With Force Balance Instruments." The increasing number of applications for force balance instruments make this paper a timely one. The principles, application and operation will be considered. Following the paper Mr. Swanson will gladly discuss any probems in relation to this type of instrumentation.

Joseph O. Cushing, Shell Oil Los Angeles Basin division, while on a recent surveying assignment near Brea heard what he though to be somebody's teeth chattering from the cold. He realized, however, this was impossible in view of the typical hot summer day there in Brea. Prompt investigation by Joe disclosed he was far too near the rattling end of a four and one-half foot "Mexican Rattler." After a battle of some intensity the snake was rendered harmless. Others on the assignment at the time were Roy Hershberger, senior surveyor and Lewis J. Paulson, rodman. Cushing is a rodman.

Irving C. Strunk, 81, who became an assistant superintendent for Miller and Lux, holder of vast lands throughout California, died in Fresno.

CHARTING THE COURSE of Western steel, Alden G. Roach (right), President of Columbia Steel Company, a U. S. Steel subsidiary, greets his newly elected Vice Presidents in Charge of Sales and Operations. O. L. Pringle, at left, long associated with Western steel production, will head Columbia's Sales Department. Laurence S. Dahl (center), former general superintendent of Carnegie-Illinois Steel Corporation's Youngstown, Ohio, operating district, and an expert in flat-rolled steel products, will take charge of Operations.

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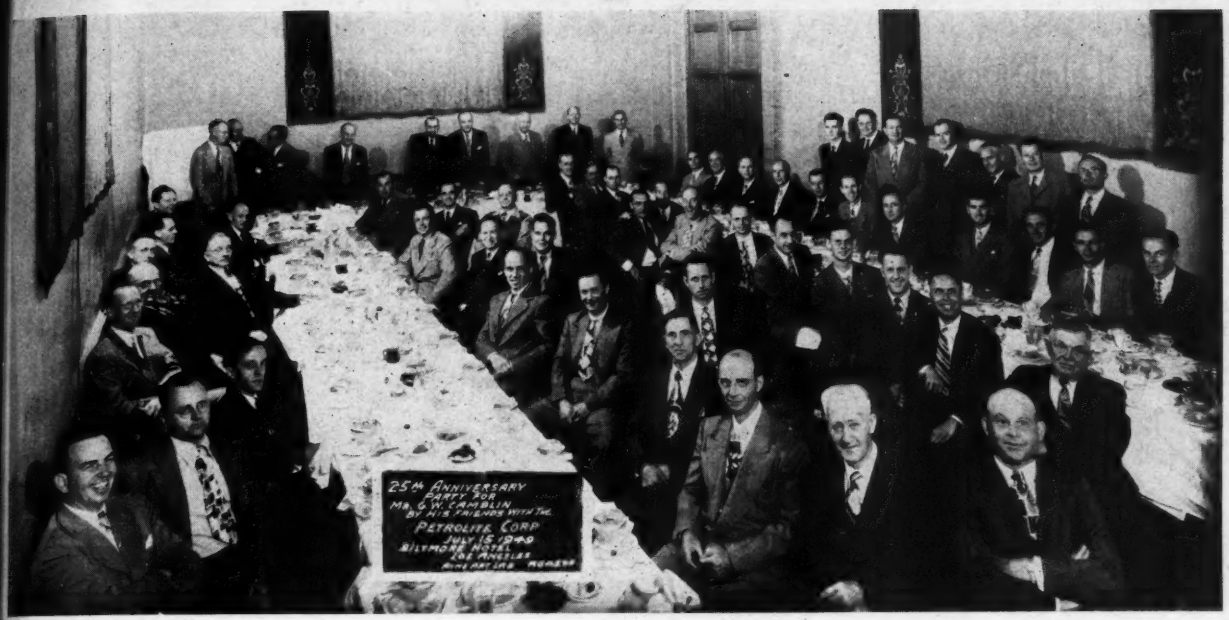

G. W. Camblin Honored By Tretolite

Mr. Glenn W. Camblin, vice-president and general manager, was honored by the Tretolite Company of California with a banquet at the Los Angeles Biltmore Hotel on July 15th. The occasion for the festivities was Mr. Camblin's completion of 25 years' service. He was presented with an oil painting by his associates in the Tretolite Company of California Division.

Mr. Camblin first represented Tret-O-lite in California in 1926. Previous to that date he was employed by the Tretolite Company out of St. Louis, with the major part of his activity as a field-engineer in the Kansas-Oklahoma district. He attended Purdue University, and is a veteran of World War I.

The Tretolite Company party was also the occasion for the presentation of an engraved desk pen set to Mr. F. L. Kelley, vice-president and director of the Petrolite Corporation. Mr. Kelley also has seen long and honorable service with the Tretolite Company and the Petrolite Corporation.

Inglewood Test Drills

California Standard's L.A.I. No. 4-3 on Sec. 20-2s-14w in the Inglewood area is drilling rapidly ahead at 8654 ft.

Shiells Canyon Project Deeper

The even tenor of drilling has passed the 7000-ft. mark in Fred M. Manning's Elkins No. 4 at Shiells Canyon, Sec. 5-3n-19w, Ventura County.

Southern Counties Gas Blythe Booster Station

Southern Counties Gas Company is enlarging its booster station at Blythe, California, by the addition of two new compressors. This will raise the total to nine units. The expansion will increase daily gas capacity from 305,000 mcf to 450,000 mcf.

141 YEARS IN PERU

These nine men, who attended a recent "Petroleum Production Pioneers" Barbecue at the Shell Barbecue Grounds near Brea, California, have all seen many years service in the oil industry and have lived a total of 141 years in Peru, South America. All of them, except the three Fowks boys, worked for the International Petroleum Company in northern Peru. "Pop" Fowks, an ex-Mayor of Paita, Peru, spent 32 years in widely separated areas of Peru in the oil, mining and rubber business. Al and Ernie Fowks were born in Paita, Peru. Reading from left to right: Lee "Lightning" Chisholm—10 years in Peru; Thomas A. "El Alcaldo" Murray—40 years and an ex-Mayor of Talara, Peru; E. B. "Ernie" Fowks—7 years; A. S. "Al" Fowks—9 years; A. E. "Pop" Fowks—32 years; R. B. "Blockio" Block—12 years; A. "Gerente" Norcott—17 years; F. D. "In The Chips" Ashton—9 years; S. P. "Duffy" Duffield—5 years.

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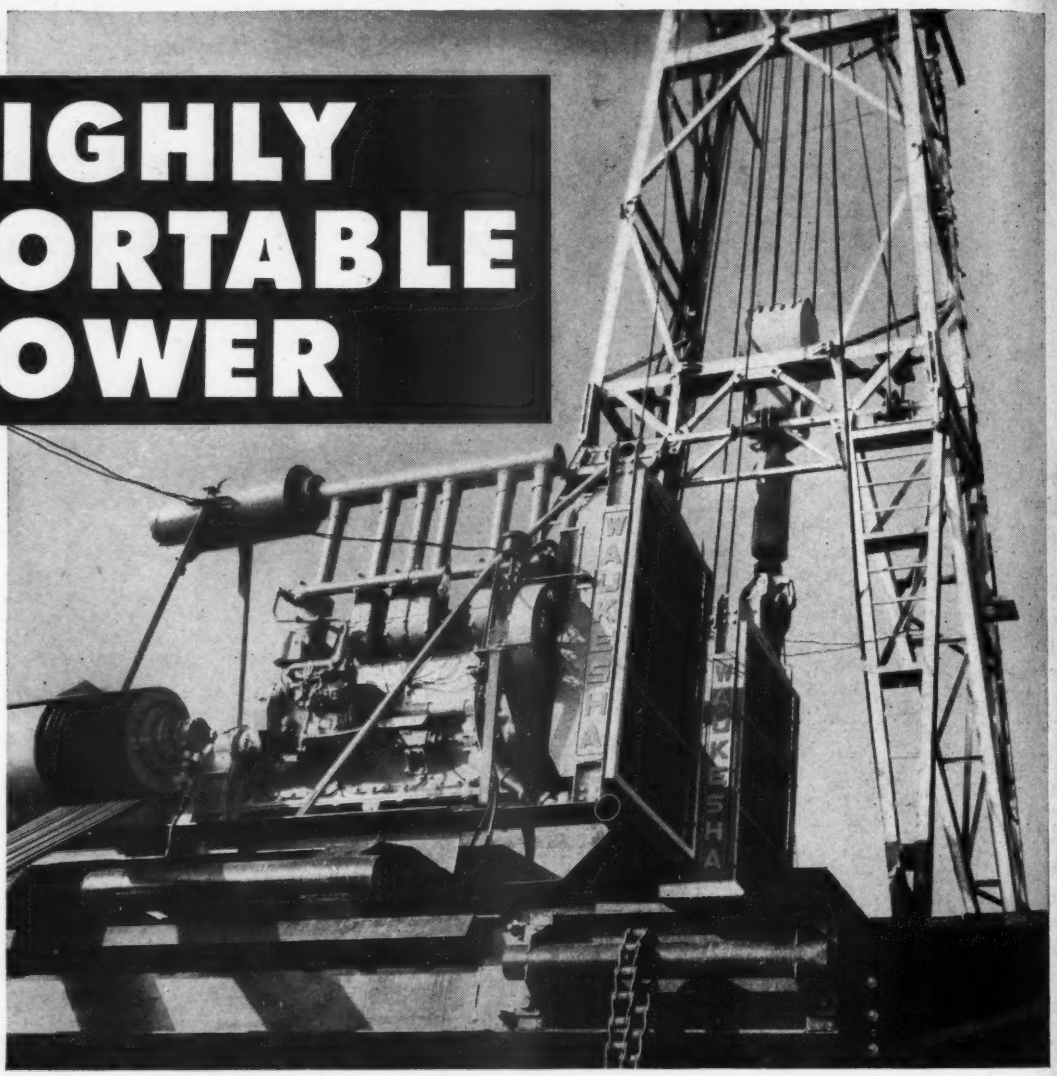

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Premier Well Service, Inc., Houston, Texas, operates this drilling rig powered with two Waukesha 6-NKU units. Their units combine great power with a high degree ot portability. That's why so many operators throughout the oil fields use them, especially for portable servicing and work-over jobs. Operating here on natural gas each Waukesha 6-NKU is equipped with a 4-cylinder Waukesha ICK gasoline starting engine, and a belt-driven air compressor, directly behind the radiator, for operation of air clutches and controls on the rig transmission.

Waukesha Model 6-NKU unit has a box base and separate radiator. Its 6-cylinder, 7-in. x 8½-in., 1962 cu. in. engine operates on 1000 Btu. gas or butane and develops peak of 225 hp. for momentary overload, and 173 hp. continuously at 1050 rpm. Its renewable wet type cylinder sleeves, positive drive water pump, overhead valves, 7-bearing crankshaft, full pressure oiling, precision bearings are detailed in Bulletins 1136 and 1122.

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Field Development

Los Angeles Basin

Aliso Canyon Wildcat Begins

Richfield Oil is about to spud its Brady Estate No. 1 wildcat well on Sec. 13-3n-17w, approximately three miles northwest of Aliso Canyon production. Location is in the vicinity of Western Gulf's old Brady No. 1, which drilled slightly below 9800 ft. for showings of some oil. Both the Miocene and Pleiocene will be tested by the well.

Del Valle Test Digs

On Sec. 23-4n-17w, Los Angeles County, Humble Oil & Refining's Newhall Land & Farming No. 1 wildcat is drilling below 750 ft. Location is a mile and one-half north of Barnsdall Oil's wells producing in the Newhall-Potrero field and a similar distance southeast of Del Valle field production.

East Coyote Well Starts

Location has been made by J. H. Fawcett for Belton Estate No. 1 on Sec. 17-3s-9w at East Coyote. Union Oil's new Hole No. 29 on Sec. 22-3s-10w is producing 225 barrels of 23 gravity oil daily from 5181 ft. Hole No. 23 is beginning operations.

Placerita Area Interest Center

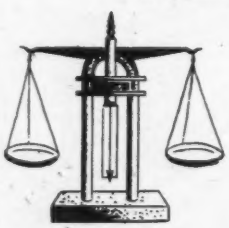
Rothschild Oil Company has completed its Rassp No. 2 well on Sec. 31-4n-15w in the Placerita area at 1852 ft. for 1000 barrels a day. The company now boasts 11 producing wells in the area, averaging each more than 1000 barrels of crude daily. Rothschild's Guilford Comm. No. 1 on the section is drilling at 980 ft. This organization, incidentally, has purchased the Caminol Oil's straight-run refinery at Santa Fe Springs. The transaction also took in seven miles of pipe line in the field, 16 acres of real property, racks, carloading facilities and other equipment. The refinery has a capacity of 5000 barrels daily and, with Rothschild's present plant, will give the company an enviable total capacity of some 12,000 barrels a day. Purchase price is said to have run well into six figures. Caminol Company, former owner of the plant, now centers all of its refining activities in Hanford. Trical Oil Company's Fehsal No. 2 on Sec. 31-4n-15w at Placerita has been completed for a yield from 1675 ft. yet to be gauged. The well extends the area 600 ft. northeasterly. Morris Estates Company of San Francisco, headed by Milton L. Kane, has obtained two drill sites on the Donnelley property. The ground under lease is adjacent to land controlled by Rothschild Oil. Independent Exploration's Placerita No. 2 on Sec. 30-4n-15w is a new well at 2325 ft. It yielded more than 300 barrels initially. The company's Placerita No. 1 is putting out 420 barrels a day.

Orange County Wildcat Plays

Amerada Petroleum's Anaheim Community No. 48-8 at Anaheim in Orange County in Sec. 8-4s-10w is drilling ahead at 4694 ft. Independent Exploration's Placentia try, South Placentia Comm. No. 30 on Sec. 7-4s-9w, is coring below 4700 ft. At West Coyote, Barnsdall Pil's Emery Trust No. 1 on Sec. 25-3s-11w is down 10,669 ft. and fishing drill pipe.

In the Athens-Rosecrans Field at the Getty Well, No. 3, Pike Drilling Co. contractors, front row, left to right: Howard Nations, mechanic; J. C. Woody, derrick; rear row, left to right: Floyd Dennis, rotary helper; Wm. Sparks, rotary helper; A. L. Kennedy, cathead.

Consider electric equipment ...in the balance!



Among considerations affecting the decision to drill a new well or abandon an old one, the use of electric equipment may well be a determining factor. **Electric equipment for drilling and pumping makes production profitable in many instances where other types might mean a loss.**

Electric equipment is efficient. It is lightweight and compact—easy to install, to start, stop and move. It is adaptable to virtually any conditions, and will operate automatically with practically no attention.

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SOUTHERN CALIFORNIA EDISON COMPANY

San Berdoo Tests Dig

Tide Water Associated Oil Company contiuues to drill steadily ahead at 3100 ft. with its Abacherli No. 1 in the Chino Hills, Sec. 12-3s-18w, San Bernardino County. The prime target is the horizon producing in the Grayco Oil Company well, completed some weeks ago. The Grayco project bottomed at 4096 ft. Approximately 16 miles west of Victorville, H. T. and G. G. Widney's No. 1 wildcat on Sec 33-6n-4w is drilling at 600 ft. Near Barstow, D. P. Hamilton's Emcap No. 1 is down 2059 ft. on Sec. 22-9n-5w and moving in heavier equipment to carry the venture down.

Aliso Canyon Well Swabs In

Standard Oil has swabbed in its Del Aliso No. 1 on Sec. 29-3n-16w at Aliso Canyon for an estimated 1150 barrels a day from 7350 ft. Gas yield is about 222,000 cubic ft. daily.

Costa Mesa Try Working

Conductor pipe has been set in Thos. W. Blakes' Costa Mesa Comm. No. 1 on Sec. 16-6s-10w at Costa Mesa, Orange County.

Richfield Well Coring

Coring has reached a depth approximating 3400 ft. in the T. & T. Oil Company Red Star No. 2 on Sec. 28-3s-9w in the Richfield field. Oil sand so far cored promises a commercial well and completion depth apparently has just about been achieved at present level.

Los Angeles Well Drills

After cementing surface casing at 864 ft. Richfield Oil is digging below 1000 ft. with its U. P. Unit No. 6 at East Los Angeles in Sec. 16-2s-12w.

Inglewood Try Deeper

Not far from the Crenshaw boulevard shopping district, Shell Oil is making hole at 12,721 ft. in Baldwin Hills Comm. No. 1 at East Inglewood. Derrick is in Sec. 9-2s-14w.

Long Beach Wells Yield

Completed in the De Soto zone, General Petroleum's Barnebush No. 5 on Sec. 19-4s-12w at Long Beach is producing 141 barrels a day from 10,-150 ft. Russ Havenstrite's McKenzie No. 1 on Sec. 19-4s-12w has been completed at 10,400 ft. for 160 barrels a day.

Newhall-Potrero Job Drills Ahead

General Exploration of California is drilling Ferguson No. 6 on Sec. 36-4n-17w at Newhall Potrero at 5768 ft. Barnsdall Oil's R.S.F. No. 85-5 on Sec. 26-4n-17w is digging at 8704 feet.

Torrance Well Digs

In the Torrance field, Standard Oil is drilling its Marble Fee No. 34 on Sec. 15-4s-14w. Depth at present is 4111 ft.

West Newport Project Spuds

Erie Oil Company's Gisler No. 2-18 at West Newport in Orange County has spudded on Sec. 15-4s-14w. First National Finance Corporation is fishing drill pipe in its Alford No. 4 on Sec. 18-16s-10w. Present depth is 3000 ft.

Whittier Job Fishes

Fishing drill pipe at 1469 ft. has called a temporary halt in drilling at 3823 ft. in Union Oil's Sansinena No. 21 at Whittier on Sec. 30-2s-10w.

Montebello Well Flows

Kern Oil Company, Ltd., Monterey No. 27 on Sec. 2-2s-12w in the Montebello field is in from 7785 ft for 225 barrels a day. No. 47 is a location and No. 49 is drilling at 650 ft.

Santa Fe Well Digs

Severns Drilling Company, contractor, is making hole ahead at 6891 ft. in Union Oil's Alexander Bell No. 2 at Santa Fe Springs on Sec. 6-3s-11w.

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San Joaquin Valley

Kreyenhagen Well Shut In

Drilled with cable tools, Elmer C. von Glahn's Oceanside No. 4 on Sec. 33-22s-16e in the Kreyenhagen Hills has been shut in, following completion at 408 ft. The well pumped at the rate of four barrels of 12 gravity oil daily.

Cuyama Valley Work Growing

The Federal Bureau of Land Management at Sacramento has approved two respective land assignments in Cuyama Valley made by Arthur C. Fisher and J. M. Maurer. The assignments covered 560 acres of Secs. 1 and 12-9n-27w to Western Gulf Oil Company, and 400 acres to Harry Rothschild on Sec. 2-9n-27w. In relation to present Cuyama production, the properties are approximately a mile southwest from Richfield's Hibberd wells. Crawford & Hiles has completed Cuyama No. 1 on Sec. 36-11n-28w on the Russell Ranch. The well came in from 3630 ft. for a flow of 500 barrels of 37.2 gravity oil a day, together with 40,000 cubic ft. of gas. Richfield Oil has finished Sloan C No. 81-26 on Sec. 26-11n-28w for 250 barrels a day from 3754 ft. The company at South Cuyama has given the final touch to Homan No. 82-35 on Sec. 35-10n-27w for 517 barrels a day from 4610 ft. Bell Corporation's Johnston No. 45-6 on Sec. 6-9n-26w is drilling below 1200 ft. It is 3500 ft. southwest of Richfield's Perkins No. 17, which came in some weeks ago for more than 4000 barrels daily.

Lindsay Hills Test Cleans Out

At Lindsay Hills, Standard of California is cleaning out to bottom at 14,587 ft., preparatory to launching convention tests with its Van Sicklin No. 45 wildcat on Sec. 36-27s-21e. On the south part of Kettleman Hills Middle Dome, Standard is testing casing in its S.F.&F.L. No. 4Z-68 on Sec. 4-24s-19e. The 9⅝-in. pipe is set at 13,703 ft. At South Dome, S.F.&F.L. No. 4-2 on Sec. 12-25s-19e is down 12,954 ft. and recementing and testing. At North Dome, No. 27Q on Sec. 27-22s-18e is testing. The project went to 10,111 ft. before plugging back to 10,080 ft. It is a southeasterly Eocene test well. Artnell Company, meanwhile is redrilling at 8691 ft., with Hawksworth-Whepley No. 2 on Sec. 35-21s-17e. The project was carried originally by a former operator to 8789 ft.

Temblor Test Digging Deeper

In the Temblor area of Kern County, Western Petroleum Company's W. P. How No. 71-30 is drilling steadily ahead near 3400 ft. Derrick stands in Sec. 30-29s-21e.

Pioneer Well Digs

Growing deeper at 10,500 ft. is Shell Oil Company's KCL-A No. 37-4 in the Pioneer area, Sec. 4-30s-29e, Kern County. What may have been promised to present depth has not been revealed by the company.

South Edison Venture Digs

Universal Consolidated Oil at last reports was drilling ahead below 2250 ft. with its Mark Morris No. 1 test at South Edison on Sec. 27-30s-29e. At West Edison, Macson Oil Company's Porter No. 4 is drilling at 750 ft. on Sec. 21-30s-29e.

Fruitvale Well Flows

Along the extreme southern fringe of the Fruitvale field, LeBow & McNee Oil Company has completed a good flowing well on Sec. 34-29s-27e. The well, KCL No. 83-B, started off flowing approximately 300 barrels of 18 gravity oil a day. Total depth is 4195 ft. Completion of the well provides an extension of Fruitvale one location to the southeast. All of the land around the new producer is held by the company, except for a few offset locations easterly, which are held by Alex Campbell and Joe Shell.

Devils Den Wells Drill

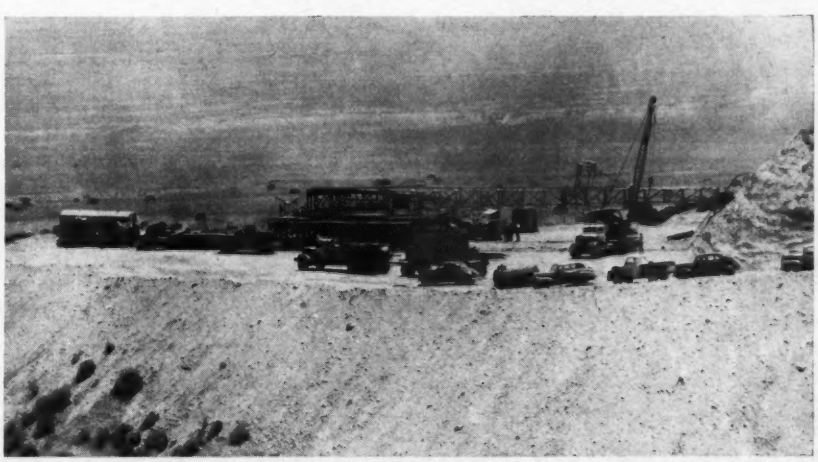
Drilling has reached 511 ft. in the Honolulu Oil Corporation AlferitzNo. 56 on Sec. 14-25s-18e in the Devils Den area. The venture is designed to go below the Wagonwheel zone in an interesting quest for Eocene production. Tritex Oil Company's Tritex-Porter No. 1 in Sec. 16-25s-18e is drilling at 2431 ft.

Arvin Test Interesting

About to spud is Union Oil Company's Miocene test below the Cattani in the Arvin area of Kern County. Drill site is about a half mile north of Honolulu Oil's Borden Comm. No. 1, which was abandoned last fall. This earlier test bottomed at 8488 ft. in Walker claystone.

Tipton Try Drills Ahead

Herley-Kelley Company is drilling at inconclusive levels with Tip-



Robertson-Lee Drilling Co. equipment being moved onto mesa elevation at the South Cuyama Field.

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(Mayari rhymes with fiery)

★ **XX Copper Bearing.** For medium pumping in mild or non-corrosive wells. Carbon steel with added copper. Normalized.

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BETHLEHEM STEEL

ton Comm. No. 1 wildcat, 431 ft. south and 451 ft. west from the quarter corner of Sec. 15-22s-24e near Tipton in Tulare County. Herley-Kelley is a member of a combination of interests made up of several other companies. They are Gene Reid Drilling, Wood-Callahan, Mar-Roo Syndicate, Transcal Drilling and C. D. Cunningham. Derrick on the Tipton project stands about 270 ft. north and 250 ft. west from the Federal Exploration Company's Kinsella No. 1, which was drilled to 5760 ft. way back in 1926.

South Belridge Well Tries High

Southbell Oil Company's northwest extension test of the South Belridge area, Southbell No. 1 on Sec. 24-28s-20e, has been plugged back from a total depth of 3050 ft. to 1500 ft. for a try higher. Showings of commercial worth were absent in the lower part of the hole.

Shale Hills Well Resuming

John L. Senior, Jr., has taken over operation of Bergman No. 1 on Sec. 5-27s-18e in the Shale Hills area and will deepen the well from the present depth of 4000 ft. Former operator was Trical Oil Company.

Temblor Nose Project Quits

Seaboard Oil Company has abandoned at 7510 ft. its Anderson No. 1 prospect job in Sec. 6-30s-21e at Temblor Nose. Electric log and dipmeter was run for a final check.

Raisin City Test Drills

Designed to drill to at least 7200 ft., the C. W. Colegrove-Coast Exploration combination has reached 2200 ft. in its southeast Raisin City test. The derrick stands 300 ft. south and 600 ft. west of the northeast corner of Sec. 5-16s-18e. The well is tagged Nevada Land & Cattle Company No. 71-5.

Amerada Nose Try Disappoints

In the Amerada Nose area of Fresno County, Barnsdall Oil Company has pulled out of its J. M. & R. No. 1-28 on Sec. 28-19s-16e. Total depth is 8006 ft. Kreyenhagen shale.

San Benito County Explorer Scheduled

Centennial Oil Company, representing Hollywood interests, has scheduled an interesting test well in San Benito County. The well will be drilled in conjunction with Barnes & Shadrick on 8500 acres of leases. The ground in question is about four and one-half miles northeast of Hollister. Drilling will be carried on in Sec. 3-12s-6e. Regent Oil's Baumgartner No. 2 near the town of San Benito in Sec. 26-17s-9e is drilling at 2717 ft. William P. Lasher and Charles Schmitz have reached 2440 ft. with their Lasher-Valacitoes No. 4 on Sec. 33-16s-11e on the Ciervo anticline. The project is reported idle temporarily at that level.

Wasco Well Still Works

Standard of California's Mushrush No. 5 on Sec. 7-27-24e, five miles west of Wasco, may by coming events prove to be the deepest producing well in the world. Drilled to a total depth of 15,866 ft., at last reports test was in progress of the interval of 15 670-

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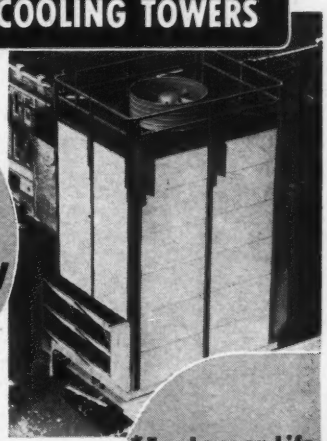

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15,690 ft. The Eocene was topped at 15,000, a few feet plus or minus.

Lost Hills Test Digs

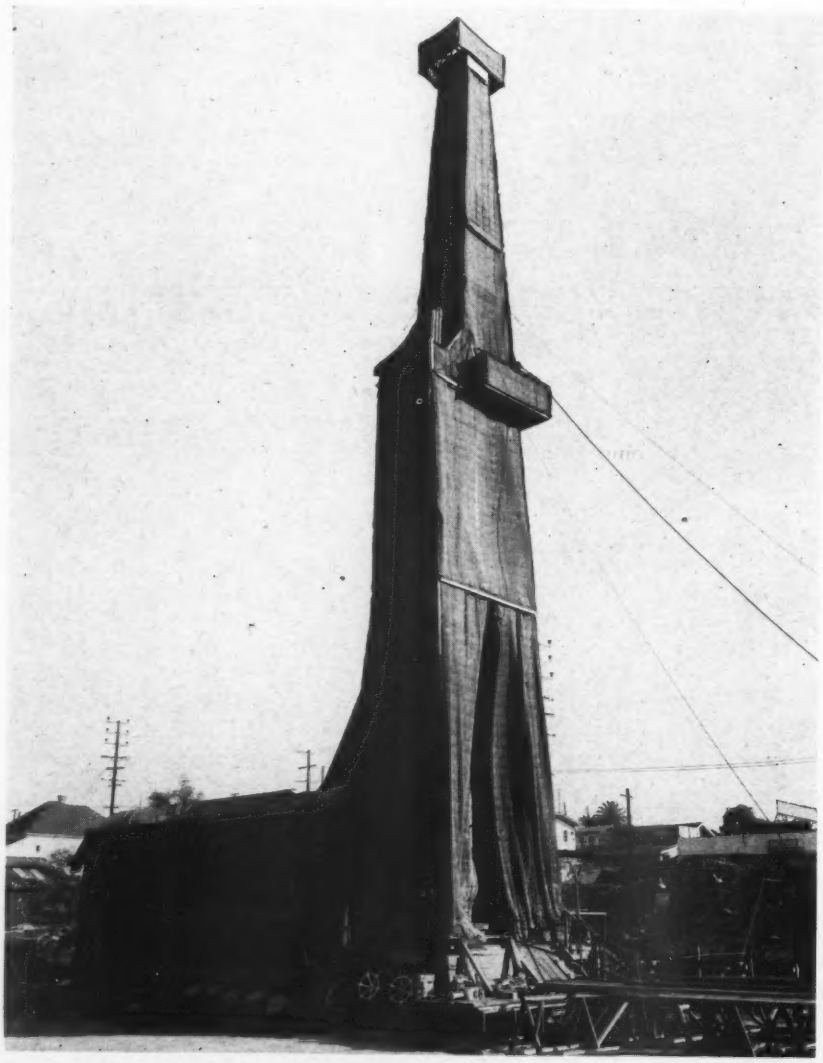
General Petroleum's Williamson No. 33-11, a deep test at Lost Hills on Sec. 11-26s-20e, continues to drill below 2900 ft. In the Calder field, the company's KCL-Calder No. 74-24 on Sec. 24-29s-25e has reached 8497 ft. KCL-Calder No. 36-23 on Sec. 23-29s-25e is rigged.

Pleito Hills Wildcat Cores

Drilling ahead and spot coring at 4650 ft. was the last operational word from Richfield Oil's Pleito Hills No. 1 exploratory well on Sec. 6-10n-20w in the Pleito Hills, Kern County. At Wheeler Ridge, Richfield's Gordon No. 43-28 on Sec. 28-11n-20w is rigged up and standing.

Paloma Test Coring Ahead

Humble Oil & Refining is coring ahead near 11,100 ft. with its KCL No. 54-9 on the south flank of the Paloma field in Sec. 9-32s-26e. A formation trial on the upper part of the zone, equivalent to the productive horizon in the field proper, resulted in salt water. The company's present plans appear to call for penetrating all phases of a series of Paloma sand. According to recorded history of the area, some wells have found the top of the zone producing water, but some of the lower stringers capable of yielding oil.



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Greeley Test Interesting

Standard of California's KCL No. 12-22 on Sec. 7-29s-26e in the Greeley area was okay on water shut off test and the well is about to be finaled. Drilled to a total depth of 10,655 ft., casing is set at 10,512. The objective 12-21 zone, which was uncovered by a prior well, was topped in the present undertaking at 10,512 ft. The sand lies between the Rio Bravo-Vedder and Stevens zones.

Cymric Try Digs

Drilling has passed the 5800-ft. mark in Pacific Western's Government No. 18-75 in the Cymric area on Sec. 18-19s-22e.

Tejon Hills Venture Digs

Vista Oil & Development Company of Vista has abandoned at 614 ft. its V.O.D. No. 1 test on Sec. 24-11n-18w in the Tejon Hills area. Granite was topped at 612 ft. Location was a half mile northwest of T. & E. Drilling Company's abandoned T.C.L. No. 1 well, which was given up at 386 ft., after hitting granite at 290 ft. Wa-Me-Co Drilling Company's Cal-Wag No. 2 on Sec. 36-32s-29e also has been abandoned. Drilling stopped at 1041 feet.

Guijarral Hills Well Completed

Flowing initially 450 barrels of 39.1 gravity oil daily through a 13/64-in. orifice, Barnsdall Oil Company has completed its Dessel No. 24-2-11 on Sec. 2-21s-16e in the Guijarral Hills. Gas yield was 227,000 cubic ft. daily.

Turk Anticline Wildcat Drills

One of the most interesting test wells currently drilling in the state is Continental Oil's S. P. No. 1 on Sec. 25-17s-15e, a mile and one-half northwest of Turk Anticline. The project is very much in the no dope category. Drilling, however, is going forward below 4000 ft.

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San Marcos Try Drills

An interesting test well is drilling in the San Marcos area of Santa Barbara County. It flies the banner of Lewis W. Welch and is known as Welch Janeway No. 1. Drill site, on Sec. 11-6n-29w, falls about four miles northwest of Fred Manning's Lazy RG No. 1 wildcat, which was abandoned a year ago at 4858 ft.

Purissima Hills Wildcat Starting

Seaboard Oil Company is starting Buell No. 4 exploratory well in the Purissima Hills on Sec. 24-7n-32w, Santa Barbara County. The company some months ago drilled an unsuccessful test well in the area.

Lockwood Valley Explorer Drills

Gene Reid Exploration Company's Dutton No. 1 wildcat, Sec. 28-8n-21w, in Lockwood Valley, Ventura County, is making hole below 1250 ft. Location is northwest of a test drilled by Lockwood Oil Company 20 years ago to 1600 ft. without commercial success.

Casmalia Try Begins

Richfield Oil's restless search for new oil is represented by a new test well in the Casmalia area of Santa Barbara County. The well, called Soladino No. 52 is drilling in the shallower formations on Sec. 18-9n-34w.

Goleta Adds Drilling Job

Pacific Lighting Corporation is rigging to start the drill in its Miller No. 4 on Sec. 20-4n-28w in the Goleta area. Honolulu Oil's No. 309-3 on Sec. 19-4n-28w has suspended operations. The try explored to 10,220 ft. and was subsequently plugged back to 6626 ft.

Gato Ridge Well Quits

In the Gato Ridge field, Standard of California has abandoned at 3680 ft. its Tognazzini No. 112 on Sec. 9-8n-32w. Electric log was run to bottom before the company pulled out.

Four Deer Well Works

Redrilling has reached 4735 ft. in the Sunray Oil Corporation Los Flores No. 13 in the Four Deer field in Sec. 9-8n-33w. The hole was carried first to a total depth of 6012 ft.

Flournoy Try Scene

Work has started on the Marker Foundation, Inc., Marker No. 2 well, 200 ft. north and 200 ft. east from the center of Sec. 28-25n-15w near Flournoy in Tehama County. Location roughly is 16 miles west of the Corning area, where Buttes Oil Felds, Inc., is drilling below 1650 ft. with Corning Comm. No. 3-1 well on Sec. 1-24n-3w. The Corning area in recent weeks has been the scene of a number of gas wells.

Pirie Test Drills On

In the Lion Mountain sector in the Pirie area of Ventura County, Humble Oil & Refining is drilling at 760 ft. with its Berylwood Investment Company No. B-1 on Sec. 18-4n-22w. Hammond No. 2 is a location. In the Somis area, the company has spudded and is drilling several hundred ft. below grass roots with its Berylwood Investment Company No. 2 on Sec. 32-3n-20w. General Petroleum's Los Posas-McBean No. 1 in the area on Sec. 34-3n-20w is down 8910 ft. and reaming.

San Ardo Try Now Fishing

A fishing job has called a temporary halt to drilling at 6399 ft. in Humble Oil's J. J. Barbree, et al No. 1 near San Ardo on Sec. 21-21s-8e, Monterey County.

Colusa County Wildcat Drills

On the Sites Anticline near the town of Maxwell in Colusa County, Universal Consolidated continues to twirl an inquisitive bit at 4000 ft. in its Peterson No. 1 wildcat. More than a year ago, the company tried unsuccessfully to develop new oil in the general area. The current effort may do the trick.

Bean Hill Test Cores

Union Oil's Santa Cruz County wildcat at Bean Hill at last reports was taking cores near 2700 ft. The well, known as Loma Prieta No. 2, is on Sec. 20-10s-1e.

Ortega Hill Well Coring

Coring at 5800 ft. was the last word as this is written from California Standard's Ortega Comm. No. 1 explorer in Sec. 16-4n-26w on Ortega Hill at Summerland, Santa Barbara County.

Ventura Avenue Old Well Re-Digs

British-American Oil Producing is redrilling at 10,750 ft. with Hartman No. 15, an old well on Sec. 21-3n-23w, in the Ventura Avenue field. The well first went to 11,707 ft. Wright & Lohman's Barnes-Sparks No. 1 on the section is at completion depth at 11,562 ft. The 7-in. pipe is cemented at 11,250 ft.

Sespe Creek Project Digs

At Sespe Creek, V. W. Moulton's No. 1 on Sec. 17-5n-19w is making hole below 950 ft. Regent Oil's Runkle No. 1 at Simi on Sec. 14-2n-18w is bailing. Total depth is 3247 ft., with plug at 1630 ft. M. H. Marr's Marr Ranch No. 17 is idle at 2600 ft. on Sec. 31-3n-17w.

Piru Well Still Works

Having recovered drill pipe fish, Jergins Oil Company is running electric log in its Larinin No. 1 test well on Sec. 24-4n-18w in the Piru area. Miocene shale was topped at 2343 ft.

Montalvo Drill Scene

Standard currently is drilling two wells in the Montalvo area of Ventura County. McGrath No. 13-9 on Sec. 30-2n-22w is drilling at 9815 ft. Thorpe No. 1 on Sec. 16-2n-22w is making hole at 6947 ft.

LAUGH THIS OFF!!

Navy wife: When we were first married you said I had a shape like a beautiful ship.

Husband: Yeah . . . but your cargo has shifted.

Mrs. McTavish (looking out window): "Mack, here comes company for supper."

McTavish: "Quick, everybody run out on the porch with a toothpick".

Little Boy to Mother: "I ain't afraid to go to the hospital, Mom. I'll be good and take my medicine, but I ain't going to let them palm off a baby on me like they did on you. I want a pup".

Beach: A place where a girl goes in her baiting suit.

His wife treated him like a Greek God . . . she placed a burnt offering before him at every meal.

I shot an arrow into the air,
It fell to earth, I knew not where.
I lose so many arrows that way.

"My razor doesn't cut at all."

"Why, Henry, you don't mean to tell me that your beard is tougher than the oil cloth."

First Lawyer: As soon as I realized it was a crooked business, I got out of it.

Second Lawyer: How much?

Ailing actor: I think I'll go to Virginia for my health.

His friend: Good idea. Virginia has cured a lot of hams.

News Item: "Overcome by gas while taking a bath, the young lady owes her life to the watchfulness of the janitor."

"Does your boy friend have ambitions?"

"Oh, yes, ever since he's been knee-high."

Waiter (to impatient customer): "What is it you wish, sir?"

Customer: "Well, I originally came in for breakfast, but if luncheon is ready now, I'll take the dinner."

Country Girl: "Pa's the best rifle shot in the country."

City Slicker: "And what does that make me?"

Country Girl: "My fiance."

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Rocky Mountain NEWS

Colorado—Idaho—Montana—New Mexico—Utah—Wyoming—Western Canada

Wyoming

Wyoming's deepest wildcat wells were "digging ahead" early in August without turning up any new discoveries as yet.

The important Moxa wildcat drilled by The Texas Co., Union Oil Co. of California and other majors north of the Church Buttes gas field, in southwestern Wyoming, found the Dakota standstone hard and tight below 12,200 feet, and is coring ahead. The Dakota sand, 15 miles to the south at Church Buttes, yielded the largest natural gas reserve in the Rocky Mountain region and is now furnishing fuel to the Salt Lake area.

Stanolind's interesting Canyon Creek test, near the Colorado line in southwestern Wyoming, registered a "gas kick" in the Tertiary sands below 10,000 feet and is drilling ahead to the Dakota around 12,000 feet. The show of gas was not commercial, but raised hopes for a structure.

General Petroleum found the Embar lime extremely hard and tight in its south Frisby venture near the Worland field in Washakie county. After acidizing and reacidizing, the well made five to eight barrels of 30.4 gravity oil per hour, swab test. Embar was logged at 10,575 feet, and the well was bottomed at 10,666. Rotary was moved off and testing is continuing. Heavier acidization, like that used in nearby Worland, may be resorted to before completion.

Amerada's deep Frontier test in Johnson county, the No. 1 Unit at Smith Cut, was probing below 12,130 feet after logging the First Wall Creek sand at 11,870 feet. No shows have been reported for the key Powder River Basin test.

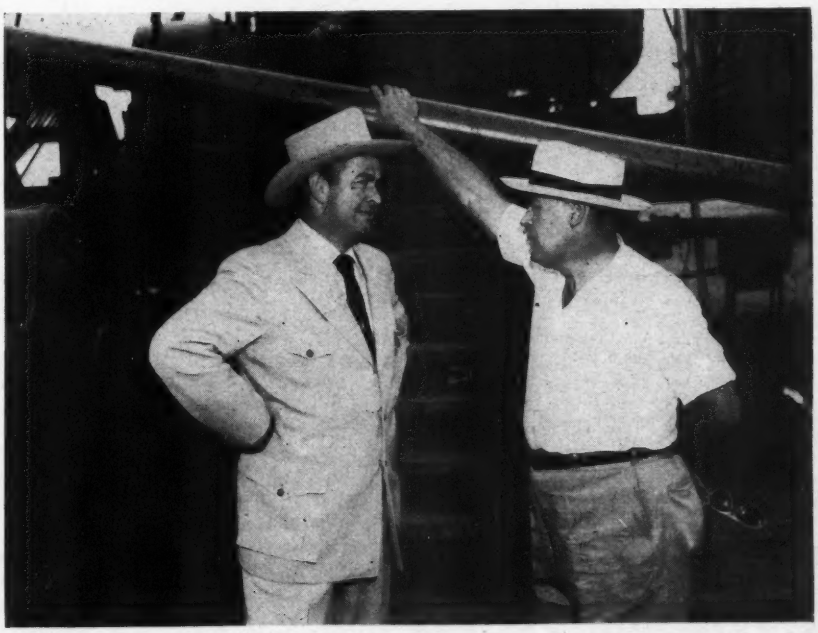
Pure Oil Co. is drilling shale below 4,000 feet at its only Wyoming wildcat test currently under way—a 10,000 foot or deeper test at Badwater, about 30 miles north of the West Poison Spider field. The test will have an important bearing on the trend north from West Poison Spider, where production is obtained from the Frontier sand at a total depth of 14,309 feet in the discovery well. Operations were suspended at the third West Poison Spider well, around 10,000 feet, after failure to find production in the Mesa Verde, which yielded oil in the second well in the field.

Tide Water Associated has set surface pipe and is drilling ahead at the Poison Spring venture, just southeast of West Poison Spider. Plans call for at least a 10,000-foot test.

The California Co. has finished drilling a sidetracked hole at Borie, eight miles west of Cheyenne, where a new discovery was made in the Muddy sand earlier this year. The Muddy, logged at 8494 feet, will be retested prior to completion.

Meanwhile, Bridwell and Seaboard have made location for a 10,500-foot Lakota test in the Meadow area, northeast of the Horse Creek field in Laramie county (section 4-17n-67w). Interest in this area was stimulated by General Petroleum's success in boosting production from the Muddy at Horse Creek from 500 to around 2500 barrels per day, also by Ohio Oil Co.'s wildcat discovery near Sidney, Nebr., in the same geological province, known as the Julesburg Basin.

While the deep tests made interesting reading, they have not caused near the flurry of excitement found in northeastern Wyoming, sometimes referred to as the "last stand" of the small independents. New locations



Independent Operators Bill Tomberlin of Casper and R. M. Barnholt, Sr., of Denver hold a confab at the No. 2 Gilmer well in Fiddler Creek, recently completed as a successful producer. Recently operators in the northeastern Wyoming fields shut down wells rather than take a proposed 50 cent cut per barrel in the posted price of $2.65. The offer was made at the time the Graco refinery in Newcastle shut down. After a two weeks' shutdown, the refinery resumed operations. Pending completion of the new pipeline, oil is trucked from Fiddler Creek to a pipeline terminal 60 miles south of the field.

SEVERNS
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for shallow wells, all the way from 3,000 to 6,000 feet, are being made at the rate of 10 or better a week in the Mush Creek, Fiddler Creek and Skull Creek fields. The success ratio has been running a little better than one strike in two efforts, but what makes the game more exciting is the fact that every venture is at least a "semi-wildcat." An offset to a producing well may turn out to be a dry hole, while a stepout several miles away may find the pay sand. This drilling for stratigraphic traps in the Newcastle sand has been referred to as "the punchboard play."

The latest successful stepout was made by H & H Drilling Co. and the Mule Creek Oil Co. at the No. 1 Martin-Conley, a good three miles west of the booming Fiddler Creek field in section 25-46N-66W. Drilled to 5,725 feet, the venture logged 15 feet of well-saturated oil sand. It may produce as much as 1,000 barrels of high gravity crude the first 24 hours, then drop to 500, and continue dropping off until it levels off at about 100 barrels per day. That has been the experience of operators in the nearby Mush Creek field, where the average now runs about 80 barrels per day per well.

Fiddler Creek, discovered only last October (1948), has grown more rapidly than any other field in this corner of the Powder River Basin. Its total production, now running about 2,500 barrels per day, promises to outstrip the old Mush Creek field.

Production in all three fields has been curtailed by the lack of pipeline outlets, but this situation will be corrected by mid-September when the Plains Pipe Line Co., completes laying a line connecting the fields to a tri-state system with a junction in the Lance Creek field, 60 miles to the south.

A good market exists for the high gravity, light crude produced in this area, but the two small refineries at nearby Newcastle—the Consumers Co-Op and the Graco plants—are unable to absorb the rising production of the new fields.

Completion of the pipe line will enable crude from this area to compete in Casper, Scottsbluff, Cheyenne and Denver refining centers.

Recently the Graco refinery shut down for a two weeks period. This caused a shutdown of many wells in the Mush Creek field. Operators refused to consider a proposed 50 cents a barrel in the posted price for crude. The pipeline tariff to Lance Creek will be 20 cents a barrel, plus a five-cent-a-barrel charge for the gathering system in the fields.

Most of the development program in the three northeastern Wyoming fields has been carried on by small independents. Even Frank Sinatra, the crooner, has money invested in three producing wells in Skull Creek, where the Newcastle pay sand is found around 3,000 feet. Among the majors, The Texas Co. has built up a substantial production which probably will be used in its refinery at Casper.

Small independents are not so active elsewhere in the state, although George G. Travis has spudded in a 2700-foot Devonian test in the scenic Jackson Hole country, following failures of either Stanolind or Carter to find oil production in this region last year. Travis secured a farmout in the Ram's Horn area from Sinclair for the test, to be drilled with cable tools. The elevation at the derrick floor is 7800.

Oriental Refining Co., another enterprising independent, drilled a Madison test to 3,308 feet in the Greybull area, Big Horn Basin, reportedly finding shows in both the Embar and Madison. Tests are continuing at the well.

At Frank's Fork, in Hot Springs county, Taylor Oil (A. B. Cobb and Oriental Refining) abandoned a deepening venture after recovering water in the Madison at 5,108 feet. Some shows had been logged in the higher Phosphoria zone, but were beset by water difficulties.

American Liberty Oil Co., a well-heeled independent from Dallas, Tex., is drilling two stepout ventures south of Continental's new Sussex field in Johnson county. American Liberty completed a farmout arrangement with Sinclair Oil & Gas Co. for 400 acres south and west of the Sussex unit, and acquired other acreage as well. The tests will be watched with interest to determine possible extension of the highly-faulted, but successful Sussex field.

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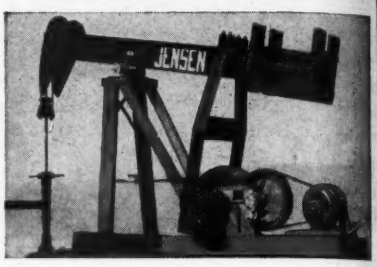

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Continental, with four producers in the field, is drilling two new semi-wildcats. Well No. 6 recently recovered oil in commercial quantities from a stray sand above the Shannon, as well as the Shannon, and is being carried down to the Lakota. Three pays have been established for the field, discovered in 1948.

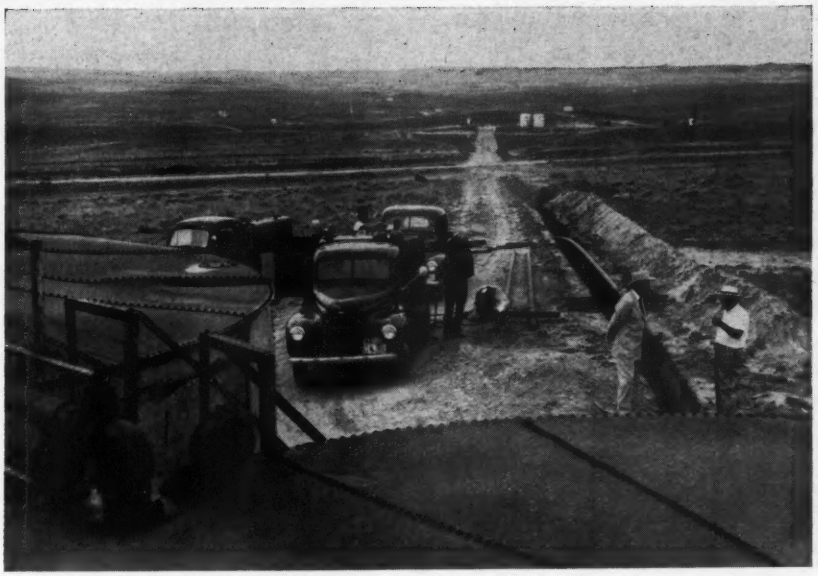
Operators in the Worland field are discussing plans for unitization of the entire field, following a marked increase in gas-oil ratios in wells outside the present unit area operated by the Pure Oil Co.

Sharples Oil Corp. of Denver, Trigood of Casper and Carter Oil Co., have lands not embraced in Pure's nearly 25,000-acre unit. Commitment of the non-unitized lands may be delayed until completion of the Texas-Gulf Sulphur Co.'s sulphur extraction plant early in 1950, and Pure's gasoline plant.

Recently irrigation farmers in the valley surrounding the Worland field have complained of damages to crops caused by sulphur resulting from the flaring of sour gas in wells. At times a smoky haze hangs low over the valley, and a light sprinkle of rain apparently brings down particles of sulphur on grain and hay crops, causing them to bleach and wither. Oil companies reportedly have paid a number of damage claims to farmers in the area.

The sulphur problem will be overcome, it is anticipated, when the sulphur plant is completed in the field. Its output will be around 300 tons of commercial sulphur per day. The sweetened gas will be processed for liquid hydrocarbons in Pure's gasoline plant, and the resulting dry gas will be transported by pipeline to domestic and commercial consumers. Recently the Wyoming public service commission turned down a request for a pipeline to Montana from the field, stating that the project involved inter-state commerce aid was outside its jurisdiction. A similar application is before the federal power commission, it is reported.

One of the most promising strikes in northeastern Wyoming was recorded in August when a wildcat well three miles west of nearest production in Fiddler Creek made 116 barrels an hour average in an eight-hour test. Production at the No. 1 Martin-Connolly well drilled by Mule Creek Oil Co. and H. & H. Drilling Co., came from a 15-foot well-saturated pay zone in the Newcastle formation, with the well bottomed at 5725 feet.



Pipeline construction is being pushed in the Mush Creek, Skull Creek, Fiddler Creek fields of northeastern Wyoming, sometimes referred to as the "last stamping ground" of the independent wildcatter. View shows welding crew connecting four-inch gathering line to a storage tank in the Fiddler Creek field. The pipeline to Lance Creek, scheduled for completion by mid-September, will provide operators in the field with markets in Casper, Scottsbluff, Cheyenne and Denver.

The discovery illustrated how luck enters into the oil game for independents, even in this era of costly deep drilling. Two enterprising Irishmen, John and Bernard Connolly, bought a quarter section of land in the Fiddler Creek area sight unseen, about 18 months ago. This summer they decided to try a wildcat well, and worked out a deal with a drilling contractor.

Two weeks before the well was completed, they went up to have a look at the land, but couldn't find the acreage without assistance. When the well came in, it was considered the biggest potential producer in Weston county.

Colorado

A new field discovery for Colorado was indicated early in August when R. E. Havenstrite, Los Angeles oil operator, struck oil in the Morrison sand at the Oak Creek wildcat in section 2-3n-86w, Routt county.

A drill stem test recovered 6,000 feet of oil in two hours from the Morrison formation, topped at 6,305 feet. A 25-foot section of well-saturated sand was cored before the test was made between 6672-6696 feet. Slightly brown in color, with a paraffin base, the oil was estimated to be 40 gravity.

The discovery is located 12 miles southeast of the Pagoda area, where General Petroleum last year made a Shinarump gas discovery and is drilling a second well this year.

Havenstrite is running casing to the top of the pay zone for completion. The acreage was assembled by L. C. Craig of Steamboat Springs, Colo., who retains lease interests throughout the 11,000-acre spread.

The Pitts-Colorado Oil Co. has abandoned its wildcat in section 2-3n-99w in the Coles Dome area, Moffat county, after failing to remove junk from the hole. The company is negotiating with a new contractor for a twin location. Shows were logged in the Dakota sand below 3300 feet, with prospects for commercial production. The wildcat is located on a block between Iles Dome and the Thornberg Field.

The Axial Basin wildcat in Moffat county drilled by W. C. McBride, Derby Oil Co., and E. K.

Carey tested water in the Dakota and Sundance, and is now drilling below 1650 feet. The well is planned as a Weber sand test around 3000 feet.

Wells in the Seeley Dome area in Rio Blanco county have been shut down for the summer because of irrigation on the lands. No commercial producers have been completed in the area, although the first well logged some shale oil prior to suspension of operations.

Ten miles south of the town of Hugo, Milo Siegel and associates have moved in tools for a Dakota test in section 3-11s-52w, in Lincoln county. The block was acquired from Frontier Refining Co. and others of Denver. Galloway and Smith of Newcastle have the drilling contract.

British-American is drilling below 5500 feet at Dry Mountain in Moffat county, with no shows reported for the wildcat. The well is located on a Tertiary high. Plans call for a 7,000 foot test.

Texas and Frontier are drilling below 6500 at Maudlin Gulch in Moffat county. This is the second well in the field which discovered oil in the Sundance formation last year.

Pure Oil Co. logged slight shows of oil in the Entrada formation at the Horse Fly venture in Montrose county. The operator ran a protective string of casing to 1510 feet before drilling ahead to test Pennsylvanian and possibly lower beds.

Three new wildcat locations have been made in northeastern Colorado in the wake of extensive leasing which followed the discovery of oil by The Ohio Oil Co., in the nearby Sidney, Nebr. area. Ambassador Oil Co., headed by F. Kirk Johnson of Fort Worth, Tex., spudded its No. 1 state in section 24-4s-48w, Yuma county. The company has a lease spread of 30,000 acres in southwestern Yuma county. Murphy and Associates of Brush, Colo., with the E. K. Carey Drilling Co. of Denver, have spudded the No. 1 Mowery in section 6-2n-56w, in Morgan county. The venture will test the Lakota sand around 6,000 feet. Plains Exploration Co. of Denver, headed by Russell Volk, plan a test in the Winston area of northern Logan county, southwest of blocks held by Ohio across the line in Cheyenne county, Nebraska.

Olin Culberson, member of the Texas Railroad Commission for 16 years, will discuss accomplishments of Texas in oil and gas conservation at a meeting of the Interstate Oil Compact Commission in Estes Park Sept. 1-3. Governor Fielding L. Wright of Mississippi also will address the three-day meeting.

Montana

The flat prairies of southeastern Montana may be punched by the drill bit in the near future to determine possibility of stratigraphic trap accumulations similar to those found in the northeastern Powder River Basin of Wyoming.

Amerada Petroleum Corp. has completed unitization of 31,600 acres in the Corral Creek block in Carter county, covering townships 3s and 4s, ranges 57 and 58e. No surface structures are apparent on the gently dipping monocline, and it is strictly a case of the drill bit telling the story. The Newcastle sand, productive in northeastern Wyoming, is believed to lie about 3,000 feet below the surface in this area.

Little drilling has been done in the region since the leasing flurry of a year ago, when Amerada, H. L. Hunt, Phillips Petroleum, Pacific Western and Sohio took lands in southwestern Carter county.

Some 25 miles southwest, in Crook county, Wyo., Amerada has had a drilling program in the Lightning Flat area. The company punched down three dry holes in Lightning Flat, and is drilling another at this time.

Hopes for Devonian production similar to that found in Alberta were dwindling in the area north of Great Falls when British-American Oil Producing Co. abandoned its No. 1 Swenson in section 7-24n-2w, Teton county. Tests made in the top of the Devonian logged slight, non-commercial shows; and the Madison lime also failed to give.

In the same general area, known as the Sweetgrass Arch, General Petroleum is drilling below 4,050 in another Devonian test. Devonian was topped at 3250, and the operator is drilling through the entire section before making tests. Slight shows were logged in the Madison lime.

Just west of Yellowstone park, in Gallatin county, Phillips Petroleum has spudded its Carrot Basin wildcat in section 11-9s-3e. The well is slated as a 3600-foot pre-Cambrian venture. No previous drilling has been accomplished in this area.

The Texas Co. has made location for two interesting wildcats in Montana. The first of these, in the large Whitewater unit of Phillips county, will test Devonian possibilities. Texas unitized 151,521 acres in this area bordering the large Bowdoin field, where the company drilled two deep tests two years ago. The company also made location for a wildcat in the Sumatra area of western Rosebud county (5-9n-34e). The location is west of Porcupine Dome —one of the largest surface anticlinal structures in Montana — where Ohio Oil Co. chalked up a deep test dry hole a year ago.

British-American has shut down its gas discovery at Clark Fork, in Carbon county, pending arrangements for marketing the gas. Continued testing at the wildcat showed an average of two million cubic feet of gas daily from the Dakota sand, with about 20 barrels of condensate. The well is located north of Seaboard's new Silver Tip field in northwestern Park county, Wyoming.

Two blocks of Fort Peck Indian reservation lands located near Poplar Dome in Roosevelt county, Montana, will be offered for sale in the near future, pending approval of the Interior department. The area is on the west flank of the Williston Basin of North Dakota and northeastern Montana, scene of a vast leasing play in recent months.

Unofficial reports said one block of about 2,508 acres of tribal lands and another 13,744 acres of allotted land, located northwest of Poplar Dome, will go on sale, in addition to another block of 21,975 acres of tribal and allotted land northeast of Poplar Dome.

Several majors have leased fee and federal lands in the Poplar Dome area, including Carter, Phillips, Texas and Amerada.

Nebraska

The wildcatting boom in southwestern Nebraska was tempered somewhat with two failures in the Sidney area, where Ohio Oil Co. brought in its discovery well now pumping at the rate of 230 barrels an hour of light, green crude.

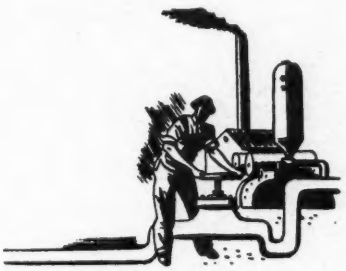
Ideal Drilling Co. and Frontier Refining plugged and abandoned their No. 1 Baker located three miles northwest of the discovery well. The well in section 20-16n-49w made 1,500 barrels of salt water in a half-hour drill stem test of the Muddy sand between 4540-4615 feet on Aug. 1. It was reported about 200 feet lower structurally than the discovery.

The first failure in this area was scored by Roberts Bros. of Shreveport, La., in section 18-15n-48w, which also tested salt water in the Muddy sand. Roberts Bros. were reported preparing to drill a second well in section 25-14n-50w, northwest of Sidney, and Ohio Oil Co. has made location for a third well, the No. 1 Stueve, in the NE NW NW 12-15n-49w, a quarter-mile east of its discovery.

Ohio is drilling below 4800 feet in its second test, the No. 1 Knievel in section 2-15n-49w, after logging 40 feet of saturation in the Muddy sand. At the present depth, the well is believed to be in the Lakota sands. Rumors of saturation in the deeper Lakota, in a 12-foot section, were not confirmed by the operator.

Two new applications have been made for a pipe line from the Gurley area to Stanolind's pipe line from Casper to Kansas City. Parker and Simmons of Newcastle and Casper applied for a permit. Previously a permit was sought by R. A. Goodall of Ogallala, Nebr., and Frank Burbridge of Omaha. The first application was made by Ohio Oil Co., who discovered the new field.

Hearings on the applications are expected in the near future.



Utah

California Co.'s discovery at Upper Valley in Garfield county has been shut down after making 136 barrels of oil and 714 barrels of water in the final test period of 23½ hours. No decision has been announced for further drilling in the area.

At nearby Johns Valley in Garfield county, the same company is redrilling below 6150 feet in a new hole. The well was drilled to 10,172 feet, where lost circulation and cavings bridged the hole around 6100 feet.

It was reported that the wildcat had not reached its objective in Mississippian beds at the 10,172 foot depth, the horizon which produced oil in the Upper Valley wildcat 25 miles to the east.

The Upper Valley discovery stimulated a great amount of leasing on surface structures throughout the vast Kaiparowitz region of south-central Utah.

Pacific Western and Equity are still digging ahead in the state's deepest wildcat at Thompson, in Grand county. The well is reported below 13,275 feet in the Pennsylvanian series, with the objective in the Mississippian around 14,000 feet.

Utah-Vernal Oil Co. has abandoned its East Ashley valley wildcat in Uintah county at a depth of 4447 feet, after testing water in the Weber sand. North of the Ashley Valley field, Equity Oil Co. has spudded its wildcat in the Naples area for a Weber sand test.

At Big Flat, Tide Water Associated tested black sulphur water in the Mississippian, between 7950-8068 feet. Top of the Mississippian was called at 7930. The operator is coring below 8150, and may drill down another 500 feet before coming back up the hole to test shows of oil and gas in higher formations. The venture is the first to be drilled below the Paradox formation on the south side of the Salt Basin.

Steps for unitizing the Gusher area block in Uintah county, southeast of Carter and Stanolind's Roosevelt discovery well, are being taken by The California Co. The block was acquired four years ago, and has been seismographed extensively since that time. A proposed well penetrating Tertiary beds around 9,000 feet has been located tentatively in section 34 or 35, 5s-19e, on the northwest side of the block.

The entire block is situated southwest of Carter's 55,000-acre Vernal Unit, where four dry holes were drilled in the past two years. At Roosevelt, the discovery well was completed in basal Tertiary for 1,633 barrels of 32.6 gravity oil in 24 hours, flowing. Carter and Stanolind have not released plans for further development as yet.

Amerada Petroleum Corp. has abandoned its second well in the Green River unit in Grand county at a depth of 5896 feet. The well flowed 100 barrels per hour of salt water with high magnesium content from the Paradox formation. It was a twin location to the first well, which was abandoned at 5645 feet with junk in the hole, after logging some shows of gas and condensate initially from the Paradox.

The Gas Turbine

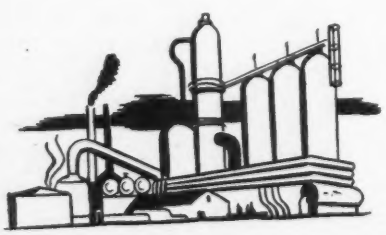
(Continued from Page 11)

tion is necessary. One shaft, usually driven from the high pressure turbine, is connected to the air compressor; the other or output shaft is directly connected to the pipeline booster. Such an arrangement permits the speed of the pipeline booster to be varied independently of that required by the compressor for best efficiency.

The regenerator is by far the largest single component in the cycle. For high percentages of effectiveness it is therefore frequently advantageous to locate it outside in order to minimize the station or building cost. It is to be noted that an appreciable reduction in the size and weight of the regenerator may be made if extended surface is used on both the air and gas sides.

A typical high pressure centrifugal pipeline booster, suitable for gas turbine drive, is shown in Figures 7 and 8. This unit is of the pedestal type, and has a single overhung impeller. A volute casing design is utilized. With such a construction, sealing is required at only one point, and the possibility of gas leakage at high pressures is minimized by the elimination of a horizontal casing split. A unit of this design is suitable for operation with peripherial velocities up to 850 feet per second, and will produce compression ratios up to 1.34 when handling natural gas having a specific gravity of 0.60 and an inlet temperature of 70°F.

In conclusion, it is noteworthy that two gas turbine centrifugal compressor pipeline units will go into operation within the next year. The attention of the entire pipeline industry will be focused on these units, and the operating experience which is obtained will undoubtedly form the basis for future similar installations.



Superior Deep Well

The world's deepest well at Pacific Creek, in southwestern Wyoming, failed to find production in the Frontier sand at a total depth of 20,521 feet, but testing is continuing in the Mesa Verde formation around 13,000 feet, with some prospects of finding commercial gas shows.

The Superior Oil Co. released complete data on the well—hitherto a tight hole—to other oil firms in the Rocky Mountain region last week.

The Frontier formation, logged at 19,720 feet, proved well-cemented and hard.

At this depth, the well had penetrated the thickest section of Tertiary and upper Cretaceous ever to be drilled. Starting at an elevation of 7,090 feet (Kelly bushing), the drill bit started in the Wasatch formation and topped Fort Union-Lance at 7,600 feet. Lewis shale was logged at 10,740 feet and Mesa Verde at 11,660. Blair was found at 15,265 and Baxter shale at 15,680. Several sands wtih faint to fair odor were logged in the Mesa Verde.

The record well proved that drilling is practicable to depths as much as four miles below the surface.

The cost of drilling the venture has been estimated at not more than a half-million dollars, not including the depreciation which may be allowed for the National 160 rig. The equipment cost approximately $1,200,000.

A total of 17 formation tests were made on the well up to July 17. There was a total of 442 days drilling, cementing, coring and testing time to the 20,521 foot depth, which was reached on June 18, 1949.

Nine fishing jobs were completed successfully, including seven below the 10,000 foot level.

The well was spudded July 13, 1947, with Dyer and Rice Drilling Co. as contractor. The well was shut down at 9,881 feet in November, 1947. The following July, Superior moved in a National 160 rig. Drilling continued steadily, with no major interruptions, until seven-inch casing was cemented at 19,765 feet with 1,000 sacks of cement. It was the longest and heaviest string of casing ever run in a well. The cement was in place in 63½ minutes.

Thereafter drilling continued more slowly, with a smaller tricone bit, to the total depth. Estimated depth to the next potential pay sand, the Dakota, is 700 to 1,000 feet, and there has been some conjecture that Superior may deepen the well after tests have been completed up the hole.

Prior to staking location in the SW NE SW of section 27-27N-103W, Sublette county, Superior blocked lands in the Pacific Creek area on the northeastern side of the Green River Basin, as early as 1943. Considerable seismic work was accomplished in this area north of the Baxter Basin uplift prior to unitization of the 36,591-acre block. The unit later was extended to the northeast.

No information other than drilling depths was given out during the drilling of the well, and all sorts of rumors of "wild shows of gas" in the Mesa Verde and other reports circulated during this period. When the well was completed, however, Superior released complete data, including a complete log, electric log, core record, history of operations and listing of mechanical operations on the well.

John C. Cody, vice president in charge of production, joined E. R. Barnett of Casper, drilling superintendent for the Rocky Mountain area, in supervising operations during the final stages of drilling and testing.

Other personnel active in the record-breaking venture were J. D. Simmons, assistant drilling superintendent; C. T. Riley, drilling foreman; K. L. Gow, district geologist; Lealand M. Knapp and Howard N. Jensen, geologists; Donald E. Koch, chief petroleum engineer; Donald L. Bohannan, petroleum, and B. R. Edwards, mud engineer.

The drillers included Oscar A. Noble, Elgin F. Burns, John A. Rossetti and Joe D. Herrington.

Derrickmen were Lloyd G. Benson, Earl L. Cantrell, Joe L. Childers, Melvin G. Goodgame and Lewis W. Sparks. Albert S. Thomas was the rig mechanic.

The floormen included Duke Bosnich, Jack S. Catlett, Billy J. Coe, Sid B. Fullwood, Joseph H. Hible, Thomas H. Jordan, Otto L. Krause, Robert E. Lewis, Kefton E. McCready, William T. Morris, Samuel D. Sisk, Andy Stoffa, Nicholas Suhayda, Dominick D. Susic, Henry K. Webster, Wilbur C. Williams and Jimmy Yardas.

M. O. Johnston Develops Hydraulic Rigs

The development of a drilling rig and hoisting rig operated by hydraulic power has been announced by the M. O. Johnston Oil Field Service Co. These rigs, the manufacturer states, operate without draw works, travelling block, brakes, clutches, and most of the working parts comprising the conventional unit.

XMD-975 is an experimental rig for drilling five to six thousand feet with 4½ inch drill pipe. This rig, which is in its experimental stage, will be used on full-scale drilling operations in Texas.

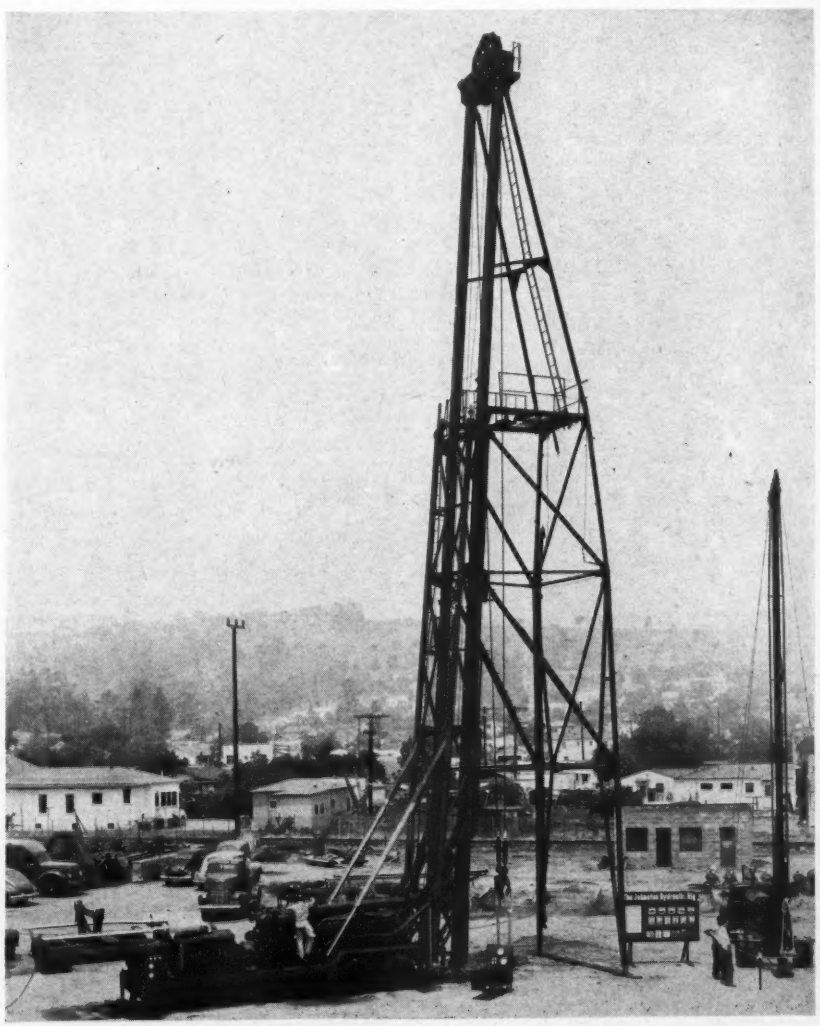
The SM-514 hoisting rig is recommended for pulling 2,500 feet of 2½ inch tubing; or 7,000 feet of rods. The SM-514 has had its initial field tests at Signal Hill and will be released for purchase in August.

These rigs are operated by the hydraulic actuating device. A nest of collapsible tubes operate in the hydraulic cylinder. The lower tube is connected to the piston. The upper tube is secured to the cylinder cap, with the tubes acting as a sheath for the wire line. The hydraulic fluid which applies power to the piston is described as not being in contact with the wire line, but is confined to the annulus between the outside of the nest of tubes and the inside of the cylinder.

According to the manufacturer, the hydraulic cylinder, or cylinders for heavier rigs, are built into a portable mast or derrick. The wire line is passed over the sheave, or sheaves, on the crown block and directly to the hook. Since multiple line reeving is not employed, the travelling block is eliminated. Power is supplied by internal combustion engines drivng centrifugal pumps. When more than one engine-pump combination is used, multiplied volume and pressure can be obtained by running the pumps in parallel and in series.

On larger capacity rigs, it is explained, batteries of small high-speed engines, each with its own individual pump, will be employed as substitutes for the larger engines now in use. Centrifugal pumps are employed as the means of power transmission. The sand reel is driven by a hydraulic motor drawing from the same fluid as the centrifugal pump. Rotary tables on the drilling units will also be driven by hydraulic motors.

Flexibility is described for the SM-514 hoisting rig because the hydraulic operating device is stated to work as well horizontally as vertically, with the same rig used to



Pictured above on the left is the large Johnston Hydraulic rig, and on the right the smaller 30 foot rig which was shown at the Tulsa Oil Show. The above picture was taken at the recent showing held at the home office of the M. O. Johnston Oil Field Service Corp., in Los Angeles. The M. O. Johnston Oil Field Service Corp. are now in production on the smaller rig, and shortly the larger rig will be completely field tested and production started.

pull rods and tubing under conventional production derricks used over open wells. The tubing line is described as being reeved over the production derrick's crown block and the rig can pull doubles of rods and tubing. Over an open well, the mast is said to be designed to pull singles of rods, and tubing can be tailed in those areas using that method; or the operator can hang the rods and stand the tubing back from the racking platform.

In the control of the SM-514, one lever is explained to act as accellerator and brake; and control is sufficiently sensitive to enable the hook to be stopped at any desired spot. A valve, which acts as a variable orifice, controls the return of the hydraulic fluid to the reservoir, governing the fall of the empty hook.

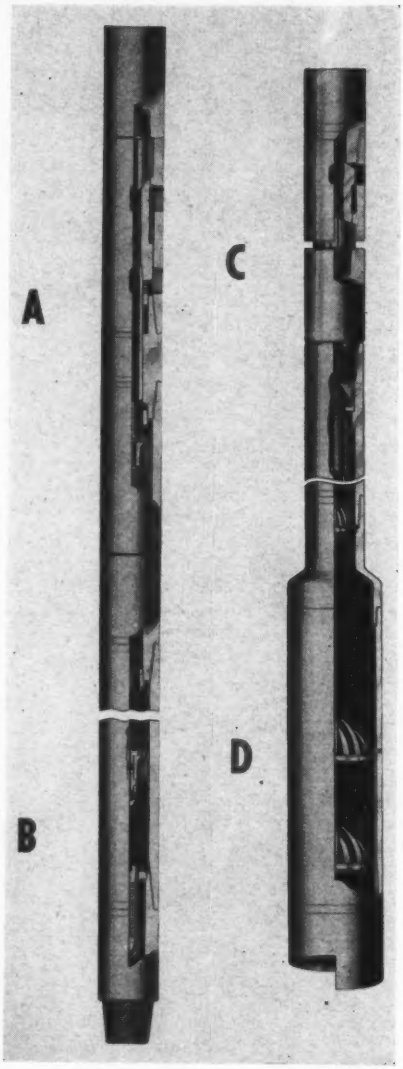
Final field demonstrations of these new developments will be made in California by Carl Engelmohr. Blaine Johnston will conduct the work in the Mid-Continent area.

Cavins Multi-Surge Junk Snatcher

The Cavins Multi-Surge Junk Snatcher is a hydrostatic multiple-action tool that is run with drill pipe or tubing to clean out holes of removable junk—rock bit cutters, blades, millings, scale, broken slips, dies, broken cement retainers, nipples, collars, short lengths of pipe, swab and packer rubbers, etc.

The tool is run in the hole assembled in a string of drill pipe or tubing and by simple top-hole manipulation utilizes controlled and limited surges of the hydrostatic head in the well to pick up and retain bottom hole junk or fish.

To fully utilize the hydrostatic head principle and at the same time assure complete control for repeated high-velocity surges in oil well bottom-hole clean-out work, the Cavins Multi-Surge Junk Snatcher incorporates two separate assemblies. The Upper Assembly consists of the Main Valve (A) and Flow Control Valve (B) which are positioned at a point previously determined by total well depth, density of fluid, and height of fluid head standing in the well. The function of the Main Valve is to seal off all



pipe below it so that when the fishing string reaches bottom there will be a differential in pressure between the fluid below the Main Valve and the air above. The Flow Control Valve (B) limits each surge to approximately one barrel; therefore, there is no danger of sloughing in an open hole. The Lower Assembly is made up of the By-Pass Valve (C) and Upper and Lower Junk Basket (D), which are run at the bottom of the fishing string. The By-Pass Valve allows the fluid to drain out of the fishing string when coming out of the hole so as to prevent a "wet" job. The Upper and Lower Junk Basket incorporate retainer assemblies which retain all junk "washed" into the baskets by each surge.

As the fishing string is set on bottom, the assemblies of the Cavins Multi-Surge Junk Snatcher function as follows:

(1) A Spline Assembly in the By-Pass Valve (C) closes to seal off side-wall ports and thus direct the force of each surge up through the bottom of the Junk Basket Assembly (D) at the bottom of the well.

(2) A Spline Assembly in the Main Control Valve (A) closes to force a rubber-sealed valve off its seat and thus open the fishing string to atmospheric pressure. Relieving pressure at this point causes a sudden surge of well fluid up through the Junk Basket Retainer Assembly which carries with it all junk from the bottom of the hole.

(3) A floating valve travels up in the Flow Control Valve Chamber (B) to seal off and stop the surge. Following shut-off at this point by picking up on the fishing string, the Main Control Valve (A) closes, leaving the floating valve free to float down from its seat as the differential pressure between it and the Main Control Valve equalize through a small-diameter bleed.

(4) An Upper and Lower Junk Basket Assembly (D) catches and retains all junk "washed" into it with each surge. The Upper Junk Basket incorporates a Flapper Valve and Strainer Assembly and a spring-type retainer for retaining small junk. The Lower Junk Basket incorporates two large rotatable spring-type retainers for catching and retaining larger junk and fish. Complete Junk Basket Assemblies to accommodate virtually any size hole and fish are available. Each Lower Junk Basket Assembly furnished is threaded to permit the use of a guide shoe or other attachments to break, shape, or center junk prior to each surging operation.

Each complete surging cycle of the Cavins Multi-Surge Junk Snatcher is instantaneous, and the operator need only pick up the fishing string to ready the tool for repeated surges.

In addition to the hydrostatic surge action employed to "wash" junk into the tool, the Cavins Multi-Surge Junk Snatcher can be rotated and used with milling shoes and other attachments to remove bridges or break, shape, or center junk prior to each surge.

Sperry-Sun Issues New Catalog

Sperry-Sun Well Surveying Company has recently issued an 8-page catalog describing and illustrating the specialized instruments of the Company and telling the story of the specialized Sperry-Sun services to the oil industry.

Covered in this catalog are the following instruments and services of interest to operating personnel:

Surwel Underground Surveying Service, E-C Survey Service, Polar Core Orientation, Johnson Elevation Meter, E-C Inclinometer, Syfo Clinograph, Non-Magnetic Drill Collar Rentals, Measuring Line Hoist Rentals and the Telefloodmeter.

A copy of this catalog will be furnished upon request to the Company at 3118 Blodgett Avenue, Houston, Texas.

New Bulletin by National

Complete illustrated descriptions of two light-weight Ideal rotary machines are available in a new 8-page bulletin, No. 359, issued by The National Supply Company. They are the FE-12½-36 and FE-12½-44, which were developed for shallow or slim hole drilling.

The bulletin describes features of design and is illustrated to show design and construction of the machines. Also included are the features of lubrication, cross-sectional and dimensional drawings, and general specifications of the machines. Copies are available from The National Supply Company, Box 899A, Toledo, Ohio.

Globe Introduces New Rock Bit

From the tips of its sharp teeth to, the last thread on the joint

Globe's latest cross section rock bit is new throughout.

Greater bearing area and stronger construction enable this bit to "take it or dish it out"—regardless of drilling speed or weight, or type of formation. Increased circulation combined with wide spaced, easily cleaned teeth overcome any tendencies to "ball up" when the going gets sticky, with the result that the bit is always smooth running, and working every minute on bottom.

The cutters are large, too, which not only permits the use of big bearings, but it gives more side wall contact and keeps the hole out to gauge from the beginning of the run until the bit is pulled dull.

Two types are available. The S-4C for sticky formations, and the M-4C for harder digging.

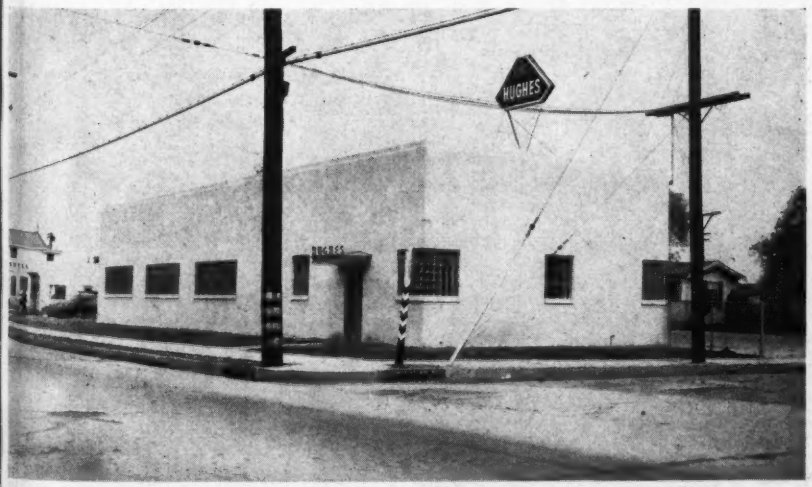
Newly Recognized Rocco Company Will Distribute Macco Drilling Muds In Wyoming And Colorado

Stan McPherrin and Al Seaman, former employees in the Drilling Fluid Division of the Macco Corporation, Los Angeles, have organized a new company which will be located at 1621 East Yellowstone Street, Casper, Wyoming. Both men are well qualified drilling mud engineers and are especially conversant with oil emulsion types of drilling fluids. They will be assisted by Jack Stone, who will be the Chief Mud Engineer for Macco Corporation in the mountain area.

The company will stock Macco P-95 Rotary Mud, Macco Wyo-Jel, Maccowate, Lube-Seal and all mud treating chemicals in Casper; Craig, Colorado, and Sidney, Nebraska.

Complete Web Wilson Stock for Rocky Mountain Area

Fred S. Dewel and Cecil Cardinal, co-owners of the popular Dew-Card Oilfield Specialty Company of Casper, Wyoming are the Rocky Mountain distributors for Web Wilson Oil Tools. They are thoroughly familiar with the Web Wilson line. They have the complete line of Web Wilson Oil Tools at their disposal and invite you to inspect their warehouse and service facilities at any time. For information regarding Web Wilson Oil Tools contact Fred or Cecil at the Dew-Card Oilfield Specialty Co., Manufacturers Agents, 630½ West Yellowstone Blvd., Casper, Wyoming.



Recently completed Hughes Tool Company Division Office and Warehouse in Compton, California. Hughes Tool Company feels that with these new facilities it can more efficiently serve its many good friends and customers in the Pacific Coast region.

Union Oil Contracts for New Research Plant

A $5,000,000 research plant to be located near Brea, California, 25 miles south of Los Angeles, will be built by Union Oil Company to replace its present Wilmington Research plant, Reese H. Taylor, President announced recently. Including twelve buildings having a total of approximatelv 120,000 square feet of floor space, the new facilities will occupy a tract of approximately 100 acres.

Final drafting of plans has been placed in the hands of the architectural firm of Austin, Field, and Fry. The plans, now nearing completion, represent the culmination of several years of preliminary study by the Company's researh department. Constrution of the buildings is sheduled to begin in September of this year. It is estimated that they will be ready for occupancy by September, 1950. P. J. Walker Company is the contractor.

The twelve main units will include administrative offices, three unitized research laboratories, an analytical laboratory, an engine laboratory, a distillation and unit process laboratory, a hazardous operations laboratory, a warehouse, a combined power house and repair shop, a library, and a snack bar and a recreation room.

"When this new plant is completed, Union Oil Company will have one of the most modern laboratories in existence. It is planned to centralize all of the research activities of the Company at the new site, including the broad fields of oil field production research, petroleum products and processing, and research in the field of petrochemicals," Mr. Taylor said.

General Petroleum Starts Construction of New Refining Project

General Petroleum Corporation has begun construction on a $2,250,000 refinery expansion project to turn more surplus heavy fuel oil into other petroleum products in greater demand.

The project will add more than 50% to the ability of the company's Torrance (Calif.) refinery to squeeze out the last valuable light hydrocarbons contained in the fuel oil, leaving only solid coke.

The expansion of the facilities for this secondary refining process —one for which General Petroleum already has the largest installation in the world—is particularly significant at this time.

A shift in market demands for petroleum products within the past few years has left Pacific Coast refiners with growing stocks of heavy fuel oil for which there is no apparent market.

While market demand for this product has slipped, demand for other products, such as gasoline, has risen. The paradox is that a refiner cannot make gasoline without making heavy fuel oil. The more of one he turns out, the more he gets of the other, since both are found in his raw material—crude oil.

With crude oil prices and other costs remaining high, and with reduced revenue coming in from the sale of heavy fuel, the drain on the working capital of the refining industry has been great.

General Petroleum first tackled this problem actually before it arose. In 1946 the company erected a "coker" refining unit in its Torrance refinery, capable of processing 15,000 barrels each day. It is the largest unit of its kind in the world.

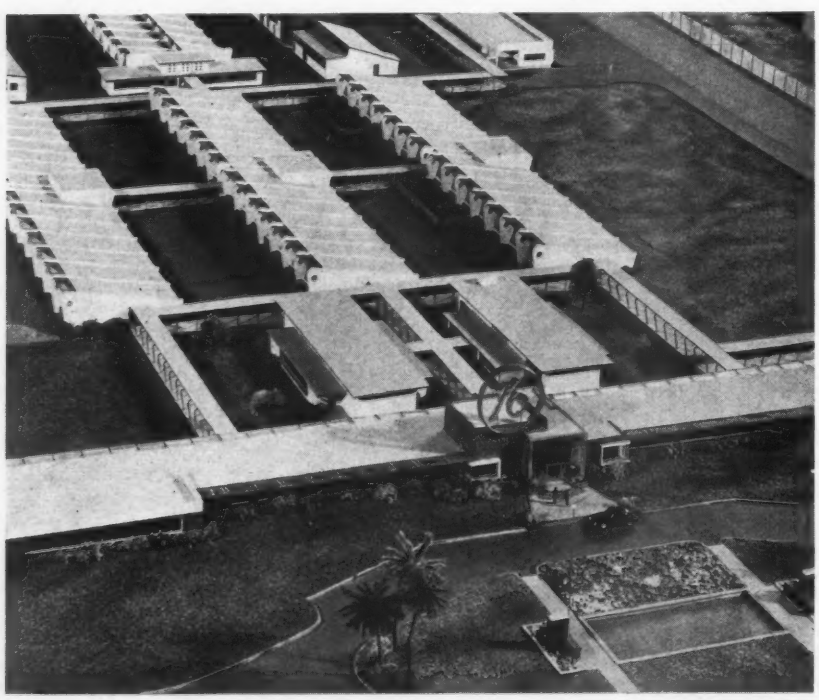
The current expansion project will increase the capacity of this unit over 50% and possibly as much as 80%.

Three years experience in operating the present unit have shown that a barrel of heavy fuel oil fed into the coker unit will yield about 20% gasoline and about 50% gas oil, some petroleum gases which may be processed into liquefied petroleum gases ("bottled" gas), and about 85 lbs. of coke. A large volume of dry gases (methane and ethane) is also produced.

The coke—over 600 tons daily—is carried away from the refinery in huge trucks—an unusual sight in an industry accustomed to having most of its products in fluid or gaseous form. It is used chiefly for the manufacture of electrodes.

The existing unit has four huge drums, each 17 feet in diameter and 80 feet high, lined with stainless steel. In them the heavy fuel oil is "cooked" until only solid coke remains. Additional components of the unit include a fractionating tower, furnaces, heat exchangers, and de-coking equipment.

The expansion project will add two more coke drums and another furnace. The other portions of the existing unit are being revised to permit them to handle the greater charge.



Scale model of Union Oil's proposed research facilities at Brea, California.

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